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CONTENTS

The City in Indian History

Narayani Gupta

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सत्यमेव जयते

CONTENTS

CHAPTER 1

INTRODUCTION

"The term urbanization refers to the process by which a population becomes concentrated in cities or 'urban places'. The process may proceed is either of two distinct ways (1) through an increase in the number of urban places or (2) through an increase in the size of the population residing in each urban place. Although the term is sometimes also used to refer to the consequences of living in urban places, scholars prefer, for that purpose, to use the word 'urbanism' ....".

P. M. HAUSER

Urbanization

1. Implying the increase in the *rate* of urban growth, has occurred in India after 1901 and has been studied for the census century (1881 +). But *urbanism* and *urban growth* for the centuries before 1881 have been studied only for short periods of time and for limited areas. Hence there are large gaps in available information.

2. The UN definition of a town as a place containing 20,000 or more people is useful for comparisons across countries and regions at a given point of time, but not for descriptions over a long period of time. Demographic size is not valid as a sole criterion, since there can be small towns and, equally, large villages.

3. Fraser and Sutcliffe (1983) suggest five types of approach for urban history :—

(i) Seeing the city as the product of a larger system of total interaction, i.e. society.

(ii) Using a thematic approach with regard to urban functions (economic/social/governmental/spatial).

(iii) Seeing the city in terms of grand processes e.g. industrialisation/de-industrialisation (this may falsely homogenise the urban experience).

(iv) Writing the biography of one city.

(v) Examining a 'family of cities' in the same society.

4. In the following study, it is proposed to do (i) and (ii) above i.e. (i) examining the process of urban growth for the sub-continent as historical geography, a sadly neglected field of study in India. This will be divided into 2 chapters, with the 1870s as the point of division; the justification is that (a) There is an abundance of census and other data for the last century, and a paucity of this for the preceding centuries; (b) the completion of the railways, the growth of mechanised industries and the unalleviated poverty of much of the countryside led to a greatly accelerated urbanization. The fourth chapter will briefly highlight those aspects of the vast body of literature on urbanism which have been used in discussions of Indian urban history, sometimes, as we shall see, by drawing false parallels. The fifth and sixth chapters survey policies and attitudes to town planning. Chapters seven and eight examine, respectively, public and private space with case-studies of individual towns, chapter nine will examine the quality of life in Indian towns, drawing on accounts in Indian and foreign travelogues and accounts. It is hoped that the consciously empirical approach adopted will save this study from consignment to "the graveyard of philosophy" which "is cluttered with grand systems which mistook analogies for concepts" (E. P. Thompson, *Poverty of Theory*, p. 296).

Note=Each chapter is headed by a section which studies the nature of the discourse on that particular theme.

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CHAPTER 2

URBAN GROWTH IN INDIA TILL THE 1870s

THE DISCOURSE

1. 'India' is often used by historians carelessly, when in fact they are referring to a *section* of the subcontinent (as e.g. when 'India' is used instead of the more accurate 'Mughal Empire').

2. Sociologists often engage in debate about distinctions between 'rural' and 'urban' values/institutions/morphology. This need not distract us, since Indian writers and travellers seem very clear about the terms they were using (see below, Five) and the same obscurity can be made to cloud analyses in other cultural contexts too).

3. The size, demographic and/or spatial, of towns is seldom known, and therefore cannot provide a yardstick for comparison. Terms like 'big' and 'small' can be highly misleading (as in Brandnock, 1987) and are usually value-loaded.

4. The periodization of Indian history today is deplorable in that it ignores the continuities, and assumes that particular dates or events meaningful for *one* area are relevant to the *whole* sub-continent.

A. TYPOLOGIES

Some towns in India 'grew', some were founded.

1. India's natural resources and her geography made it possible for her to offer much for overland and overseats trade. Towns were necessary as distributing points. The distance between them varied with local geography and the nature of transport. The Great Northern Plain was characterised by a few large cities and many small towns. Fertile river basins, like that of the Kaveri and Krishna, had a number of medium towns. Brokes terrain, as in Mysore, Saurashtra and Kerala, had many small and a few medium urban centres. Before the railways were built, there were clear routes in India, land and riverine, which enable us to map successive Indian urban centres. It is worth emphasizing that there is a remarkable continuity in these, particularly in the medium and large towns. About 200 towns in the 1981 census' list of 100,000 + towns have very ancient pedigrees. This can be understood only in terms of their role as commercial knot-towns.

2. Robert Orme in the 1760s commented that he knew no country as rich as India and no country so incapable of protecting her wealth. Most Indian towns were open and unwalled, but successive regimes did build fort-towns to protect their states and, in particular, their capital cities (the Vijayanagar Empire, the Marathas, Tipu Sultan, the British). Some of these were simply forts, but many formed the nucleus of large urban areas (Golconda, Gwalior, Velore), described as *qila*-and-*shahar* or *pettai-kotta* complexes. For administrative control a hierarchy of medium and small towns were set up by powerful empires like the Mughal.

3. 'Regal-ritual' towns were political necessities and, on occasion, mere status-symbols. In Orissa there are examples of old temples being made into urban centres with royal patronage. These were founded or deserted with an ease which appears disconcerting to us (for example, Tughlaqabad, Gangai-Konda-Chola-Puram, Vijayanagar). Capitals were also very important for small kingdoms. These were most numerous in areas where geography made centralised authority difficult (Saurashtra, Madhya Pradesh), and vying with neighbouring states in the construction of viable capitals was a common form of rivalry.

4. The Judaic religions have *one* sacred place, but Hinduism has a sacred *geography* (applicable at the macrolevel to the country, at the microlevel to a specific town's area). The 4 'mathas' of Sankaracharya in the 9th century established the cardinal points in the geography of Hinduism. The places of pilgrimage have a hierarchy of their own. This applies to Hinduism (Bhardwaj) but Indian Islam also has its sacred places, like Ajmer, Nizamuddin, Nagaur, which have become urban centres. Likewise with Buddhist centres, chiefly in Bihar. The pilgrim traffic has not only taken Indians far beyond their immediate hinterlands, but also sustained an urbanism in these cult-centres, and fostered a second-range one at equidistant intermediate points, at *sarais* or *chavadis*. Indian literature from the *Arthasastra* onwards have a clear hierachy of roads, indicating the different widths desirable. *Note:* The vast distances Indians travel today across the country, moving from 'home-town' to 'work-town' creates an interlinked urbanism, but longdistance travel is *not* only a post-railways phenomenon.

Note : In the country's geography, forests were the most impassable barriers, with deserts and wide rivers coming second.

5. Ports were numerous on the west coast, spares on the east. This is explained by the nature of the coastline, as well as by the proximity of the west to Africa and Europe. The volume of trade with the Western Coast can be gauged by the number of ports, at close proximity, that have been listed in accounts and maps over centuries. Some of these have disappeared, but they indicate a period when India occupied a very prominent place in the India Ocean trade.

6. The nature of urban settlements in India have varied over time and place. While many of them have been multifunctional, the dominant function of each has been easy to pinpoint. There is a range of urban patterns in the subcontinent. If the Ganga valley was like France (primate cities and small towns) and the Kaveri valley like the Rhine valley (numerous medium towns) the Kerala and Konkan coasts were like the Netherlands with a dispersed urbanism, but *unlike* the Netherlands in having no major town.

B. HISTORY

1. By 2000 B.C. there was a network of town in the northwest, along the Indus and the Sutlej. These were a chain which acted as collecting and dispatching points linking Mesopotamia to Central Asia. They were also centres of crafts. From 2200 B.C., till 100 B.C., there were many urban sites and mounds here, as far east as Delhi. Some scholars have suggested that there was a hierarchy in the Indus sites, with Mohenjo-daro as the biggest site but not a primate city. Nothing is known so far about urban centres in the same period in the rest of India.

2. There is then a long gap in archaeology, which could be explained in terms of the building materials having been of perishable wood and not of enduring bricks, and leaving us no further than the traditional understanding that the early Aryans who settled in the Northern Plain were an agricultural people, who learned, or taught themselves, the art of town-building *de novo*. The next period for which urban centres are known is from the sixth century B.C. in north India, and the first century B.C. in the south. Major towns are known from archaeology and literature, but there is no data for smaller centres.

3. The seventh century A.D. saw the decline of many big towns in the Ganga valley, and the growth of a few others. The explanation used to be that a major ruralization was taking place, but the more plausible reason seems to be that main arteries of trade were diverted, and that the centralised empire of the Guptas was replaced by smaller kingdoms. In this same period the south was cut off from the north, when the Chalukyan kingdom of Andhra was marked neither by large scale long distance trade nor by major urban centres.

4. From the eleventh to the fifteenth centuries the Jamuna-Sutlej and the Jamuna-Ganga doab saw prosperity and urbanization, with the emergence of big cities. In this same period in the river-valleys of the south many major urban centres were growing, under the dual stimulus of political centralisation and overseas trade. To maintain control in a terrain fragmented by geography, *brahmadeya* lands were farmed out to brahmin communities. Also each geographical unit of the empire (a *nadu*) had a headquarters town. Figures for the trade-centres and *brahmadeya* settlements in the Chola Empire are available, as also major cities and *qasbas* in the Mughal Empire. (K. N. Chaudhuri, S. Moosvi, B. Stein, K. R. Hall). This data encourages attempts to build network-pictures, on the pattern of Rozman for Russia and Skinner for China (S. Blake, S. Moosvi). These 'networks' are based on *functional* classification, not on the *size* of towns, for which statistics are not available.

5. In the seventeenth century, as centralised empires in the north and south disintegrated, urbanism occurred (a) as a result of plantation—*madad-i-maash* grants in the north, like *brahmadeya* grants earlier, and district towns in Mysore under the Wodeyars; and (b) as a result of successor-states or rebel-states being set up. Political atomization was accompanied by the proliferation of administrative centres. There was a hierarchy of these too—if political governors made their provinces independent of imperial authority, the district officers or fort-commanders often in turn became independent of them. The well-documented account of the urban places in the Coimbatore area in the 18th century is typical of many similar areas.

6. The late 18th and early 19th century was a period of deurbanisation in two senses (a) decreasing population in towns, because they became politically powerless (Tanjore, Murshidabad, Calicut, Cochin) and (b) destruction (often temporary) of towns in heavy warfare activity (old Pondicherry, Srirangam, Gaur).

7. From the second quarter of the nineteenth century, the British regime was forced to foster urbanisation to help trade, to help in revenue collection, and for reasons of defence. As the British empire expanded, it sought to extend its trade priorities ahead of its political (R. Mukherjee) and for this as for revenue collection, towns at roughly equal distance were desirable. The district towns of British India were often upgraded villages or small towns (C. A. Bayly). The towns in the hinterland of the Presidency towns, particularly Calcutta, never grew to a size which could enable them to constitute a hierarchy. In functional terms, so much was concentrated in Calcutta that it became and remained a primate city, with a catchment area extending to the north-western provinces. The growth of Bombay began from the 1860s, with the cotton-boom and the opening of the Suez Canal. Madras had a high

population but because it was neither such a major trade nor an administrative centre, it did not create the same "urban atrophy" as the other two. Cantonments, unlike district towns, were concentrated in areas of greatest need—hence the large number in the Doab and on the north-west frontier.

8. From the middle of the 19th century political integration and the railways were to lead to the growth of trade, and in some cases of industry. This led to immigration from smaller to bigger towns, and from the countryside where capitalist agriculture was pushing the poorer tenants to the wall. This and periodic famines, meant that towns were beginning to act as magnets for the rural poor to a greater degree than earlier.

9. The picture by the 1870s is that the subcontinent, like Europe, had gone through periods of urban growth and urban decline, which were to some extent connected with the rise and fall of political regimes. Trade centres and cult-centres did not suffer, and what is remarkable is that, give and take some population differences, so many old sites remain towns till today.

CHAPTER 3

URBANIZATION IN INDIA FROM THE 1870s

THE DISCOURSE

1. The growth fetish has led to the use of the terms 'growing', 'stagnating' and 'declining' to describe towns; these have value-connotations which are derived from the West and should be abandoned.

2. Before and after Independence, the *number* of towns in each province/state were regarded as status-symbols. Statewise imbalances are clear, but the regional ones imperfectly appreciated. As a result, urgently-needed correctives to ensure a balanced urbanization have not been taken.

3. The Censuses have to be treated with caution, since their definitions of towns have varied.

4. Demographers and economic historians, in their concern to show that British India was a case of "dependent urbanism", have not examined towns in the 'princely states', which show many features of interest in settlement patterns.

A. TYPOLOGIES

1. From the 1870s the three Presidency towns, the classic 'Colonial cities', pay the penalty for becoming railheads as well as ports, administrative headquarters as well as political power bases. They grew spatially and demographically into regional primate cities, by extending their boundaries into the rural hinterland, and by absorbing large numbers of immigrants from further and further a field. In the case of Calcutta, in 1947-48, the burden of Partition led to an enormous influx of refugees to a degree not seen in any other town.

2. Some medium-sized towns grew on account of being railway junctions—Gorakhpur, Kanpur, Coimbatore are examples.

3. The alignment of the railways meant that a few towns acquired industries. In the decades after the First War industrial towns came to be established in their own right. Bhilai, Rourkela and Durgapur were the successors to Jamshedpur. In Punjab, the stimulus of the Canal colonies also led to the development of some towns.

4. 30-odd 'hillstations' were developed as summer resorts by the British, and near major towns 'health resorts' like Puri, Ranchi and Deogarh also were fostered.

5. District towns and cantonments expanded as service and trade centres.

6. Urban areas were created in the late 1940s as 'refugee townships', chiefly in Punjab and in Bengal, Bihar and Orissa, and many of these became viable towns.

HISTORY

1. In the half-century from the 1870s to the 1930s, India underwent the transport revolution. The railways superimposed a colonial route network over the natural network dictated by geography. This led to an aggravation of a tendency manifest even earlier, i.e. the development of the Presidency towns into regional primate cities (Habeeb). The railways, (built in two spurts—1860s—70s, 1890s—1900s) led to the movement of peoples over longer stretches and from one town to another, but they did not lead to a steady growth in small and medium towns in British India. The largest 8-10 cities grew markedly by the location of industries and because of migration due to famine. "The increasing accessibility of Presidency towns reflected their administrative importance rather than their economic importance within India. The railway system by-passed the area of raw material resources—the iron-ore and coal in the north-east. These had stimulated Europe's industrial revolution and urbanization", (Bradnock). There were smaller towns which also showed high rates of growth, but these were generally located along the newly-constructed railway lines. These were centres of British industrial enterprise, or railway junctions, agricultural marketing or collection centres, and centres of extractive industries. They did not become *cores* in the true sense of the word, i.e. cores with a cluster of urban areas with high growth-rates around them. Thus the medieval urban structure, which had comprised of several sub-systems evolved around regional cores, was replaced by one of 'satellite' primacy and urban atrophy (Habeeb). The growth of Bombay in the first half of the present century was the most marked not in spatial but in population growth (Munshi). By contrast to British India, the Cotton and Grain Markets Act of Hyderabad in 1897, the growth of towns in Mysore and the increasing urbanization in Cochin and Travancore indicates that a *balanced* urbanization could be brought about in the States, though this was discouraged in the hinterlands of the Presidency towns by these towns' primacy. Trade and industries were encouraged in these states, but uncontrolled urban settlement was checked by careful town planning. The medieval pattern of regional sub-systems therefore continued in these enclaves.

2. The most rapid urbanization occurred in the 1941-51 decade, with increased industrialization and with many refugee towns and industrial areas being planned and built. The exhilaration of Independence and the sense that India

could now launch on a policy of industrialization was only marginally dampened by the problems created by the refugee influx. In some cases refugee townships because the nuclei for industrial towns. Only to a small degree was there conscious *regional distribution* in planning these towns (Ved Prakash, Koenigsberger).

Refugee Towns

Rajpura	Hastinapur
Nilokheri	Govindpur
Faridabad	Naini
Tripuri	Rudrapur
Gandhidham	Govindanagar
Sardar Nagar	Ashoka Nagar
Kubernagar	Model Town
Ulhasnagar	Jullundur
Ludhiana	Ambala
Hoshiarpur	Sonepat
Hissar	Rewari
Karnal	Palwal
Rohtak	Jagadhari
Gurgaon	Chembur colony near Bombay
Khanna	Mullund near Bombay

Panipat
Gandhinagar (Valivade near Kolhapur)
Pimpri near Poona (Various Colonies)
Delhi in and around Delhi

Industrial Towns

Steel Towns
Rourkela
Durgapur
Bhilai Nagar
Bokaro

Refinery Towns
Barauni
Noonmati
Gauhati

Fertilizer Corporation Towns
Sindri
F.C.I. Town at Gorakhpur
Naya Nangal
F.C.I. Colony at Chembur, Bombay
F.C.I. Town at Namrup
F.C.I. Town at Durgapur

Industrial Towns
Pimpri near Poona
Rishikesh
Jalahalli (Bangalore)
Dooravaninagar (Bangaolre)
Hindustan Aircrafts Ltd. Town Neyveli
Govindpura (Bhopal)
Jagannathnagar (Hatia)
Durgapur
Durgapur Coke
Over Plant Town
Oil and Natural Gas Commission (O.N.G.C.)
Colony at Baroda
O.N.G.C. Colony at Ankleshwar
O.N.G.C. Colony at Cambay
Rajhara
Jharandalli (Mining Colony)
Dandeli
Nangal
Barapani
Naharkotia (or Naharkatiya)
Kailagarh
Nepanagar
Kalyani

After Independence, the basic organization of the Indian economy has been a fourfold regional one around the 4 great metropolises, Delhi and the 3 Presidency towns (Brian Berry). The primacy of Calcutta in eastern India remained pronounced. The Bombay-conurbation grew at the expense of other centres in the region. The 'population hinterlands' of Calcutta and Bombay were much larger than that of Madras and Delhi (Munshi). Punjab's population increased 46% in the 1950s. That of Madras was eroded by the rise of Hyderabad and Bangalore as major regional centres. In the north, the large cities were large because they were 'underdeveloped' in relation to the *civilisational* infrastructure (Sopher). Even in 1961, 'industrial towns' were only 39% of the total, whereas 'Service towns' were 47% (Sdasyuk). In the 1951-61 census, the rate of *urban* population growth was not much higher than that of the *general* growth (26% and 21%). But in 1961-71 the differential was marked (38% and 24%) (Sdasyuk). There was also a marked differential rate of growth of large cities and the general urban growth. In 1901 the residents of the (26) large towns had a *quarter* of India's total urban population, in 1971 those of the (147) large towns had a *half*. The 1950s was the decade of 'medium towns' in France, as the '40s' had been that of 'new towns' in Britain. In India there was an attempt to develop small and medium towns. Also, in the belief that industries had been concentrated in the towns, a new policy to locate these in rural areas was launched. In both cases, there was a serious lack of infrastructure by way of communications, so that the continuum was not established. (By comparison to the USA's village=market town ratio in 1965 India needed 47,000 medium towns and had only 2000).

In the early 1960s, practitioners like Mayer and Shafi, analysts like Ved Prakash, Sdasyuk and Johnson, all agree that inadequate attention was given to (a) the regional setting in the planning of new towns. This had been understood by the planners. In the 1960s the Planning Commission had stated in the Third Plan that "the benefits of a large project accrue in greater measure to the population of the region in which it is located if certain related or complementary programmes and schemes are undertaken". (Sdasyuk, 249). (b) Special planning i.e. the location of urban centres and the diffusion of industrial activities away from the big towns,

which were reaching a saturation point in the ratio between populations and services (J. P. Lewis). The initial decisions, made by the respective state governments during the period of the Second Plan (1956-61) were to locate most industrial estates *near large cities* (Delhi, Madurai, Madras, Allahabad, Hyderabad); a few were located near medium-sized cities, but there was no clear and consistent policy of spatial development (Johnson). In the face of protest from small towns, the Third Plan decided to locate industrial estates in *rural communities*. This resulted in a further waste of resources, and promoted a polarization, where "the progressive elements in society are gathered into metropolitan concentrations that—pull further and further away from the traditional rural mass". (Lewis).

N.B. The general interest in Indian urban problems led to a great deal of writing on the subject, culminating in the Berkeley Seminar of 1962 (*India's Urban Future*). This book should be treated as a benchmark and compared with today's reality.

It is interesting to note that, despite the disadvantages created by colonial policies (that encouraged metropolitanisation) and independent India's policies (which ignored regional planning) there were some areas where there were uniform networks of towns with similar functional structure and size--the Punjab-Haryana Zone, the Krishna-Godavari deltas, the Kerala coast. Pre-colonial cultural and economic *geography* rises above modifications caused by policies in these areas.

Technology therefore has *not* conquered or modified geography drastically. The reason why it has not is that the attempt at 'national' policies is the last 40 years has had to work against differential factor-endowment in different regions, against the pulls from the different states, against the imbalances in urban growth creates in the colonial period. One of the reasons for the lack of dynamic policy could also be the absence of public interest in these issues, which remain the esoteric prerogative of officials and specialists, who find it difficult to integrate policy. By contrast, as the next chapter will show, in the West there has been a long tradition of analysing urban phenomena, and the link between public conscience and public policy is very close.

Chronology

1863	Indian Sanitary Commission's Report
1884	Principle of local self-government in different provinces
1892	Indian Labour Commission
1894	Land Acquisition Act
1901	Famine Commission Report
1902	Consulting Architect appointed, Govt. of India
1907	Hewett suggests Improvement Trusts to Govt. of India
1908	Sanitary Conference, Nainital
1911	Calcutta Improvement Trust
1911	All-India Sanitary Commission
1915	Bombay Town Planning Act
1916	Indian Industrial Commission
1917	Patrick Geddes comes to India
1919	Kanpur and Lucknow Trusts
1919	U.P. Town Improvement Act
1920	Allahabad Improvement Trust
1920	Madras Town Planning Act
1920-28	Backbay Reclamation, Bombay
1921-31	Kolhapur State's 'City Development Ministry'
1922	Discovery of Mohenjodaro
1925	T.W.S. Forest, *Indian Municipality*
1929	L. Bogle, *Town Planning in India*
1931	Report of the Royal Commission on Labour in India
1933	Travancore Town Planning Regulations
1942	Jaipur City Extensions (Mirza Ismael)
1944-54	Development Scheme for Kolhapur suggested (by J. P. Naik)
1945	Cawnpore Urban Area Development Act
1945	P. J. Griffiths *Better Indian Towns*
1945	O. P. Aggarwala *Towns Improvement Trustsin India*
1945	Travancore Town and Country Planning Act
1946	Delhi Planning and Siting Committee
1946	Health Survey and Development Committee (under Bhore)
1947	Kanpur Master Plan
1947-48	Bombay Master Plan
1948	*National Planning Committee Report*
1948	Industrial Policy Resolution (led to Rourkela Bhilai, Durgapur)
1949	Sris Chatterjee's books on town-planning
1951	Bihar Town Planning and Improvement Trust Act
1953	Punjab's new capital
1954	Bombay Town Planning Act (enforced from 1957)
1955	Establishment of School of Planning and Architecture at Delhi
1956	Orissa Town Planning and Improvement Trust Act
1957	Delhi Development Act
1958	U.P. (Regulation of Building Operations) Act
1959	"Land Acquisition and Development Schemes" (for Bombay, Calcutta, Kanpur, Delhi, Ahmedabad), Ministry of Works and Housing
1959	Assam Town and Country Planning Act
1960	Kerala--unified town and country planning bill
1960-75	400 master plans for Indian towns and town regions
1961	Mysore Town and Country Planning Act
1962	Model Town and Country Planning Act, Govt. of India
1966	Maharashtra Regional and Town Planning Act

CHAPTER 4

URBANISM, URBANIZATION AND URBAN THEORY

THE HISTORIAN & THE CITY

> "Men in one epoch may resolutely set their faces against the past; men of the next may venerate that previous era and deplore their predecessors' heedless neglect. The ebb and flow of historical self-awareness, of anachronistic recognition. Of concern with heritage are themselves historically causal. We are inescapably the creatures of the past we have come through, including our own attitudes towards the previous pasts".
>
> LOWENTHAL

At a time when the proportion of urban dwellers is increasing at a greater rate than ever before a survey of theories and studies of towns is instructive. In particular, it will bring out the most distinctive quality of 'urban history'—its interdisciplinary character. It is a field in which geographers, sociologists, anthropologists, demographers and economists have contributed and profited by interaction. The historian's task is to see the context of the *process* and of the *discourse*. The city can be seen as evolving as (i) a land-scape, (ii) a marketable commodity, (iii) a set of institutions, (iv) a group of classes, (v) a set of values distinct from those of the countryside and (vi) representative of particular cultures. In short, in terms of morphology, institutions and the quality of life. The interpretation of these at different times by scholars have been influential, but it is equally important to remember that they were initially *influenced* by the situation in which they wrote. The chief purpose of this chapter is not to create paradigms but to understand the context of many ideas and categories which in India are being used *without reference to the context*.

THE DISCOURSE

Writing and thinking about urbanism was, till seventy years ago, done in a holistic fashion. Today it is broken up into many specialised investigations and spills across the boundaries of traditional disciplines. There are two broad kinds of study--*typologies and intracity morphology*:

Typologies

1. 'The city of antiquity', the 'medieval town', the 'modern town', and, most recently 'the post-industrial town' carry with them certain assumed distinctions. Thus, the 'city of antiquity' is taken to be the Greek town, the 'Medieval' the European (the Middle Eastern is hived off into 'the Islamic town') and the 'modern' is the American. A residuary category is the 'pre-industrial town'.

Intra-city Studies

2. The discourse on urban morphology (i.e. the relations between forms and functions) is something which reflects clear cultural differences. In Britain its closest affinity is to historical geography, in France to political history, in the USA to a historical sociology, in Germany earlier to sociology, then to geography.

In the Anglophone world "many of the attempts to generalise the arrangements of land use in urban areas have been based on North American data, and almost all upon examples from countries in which the free-enterprise element in social organisation is dominant". Increasingly, however, one is becoming aware that there is a meeting-point between Marx's theory of rent and the Chicago School's ecology paradigm, for the study of the *morphology* of towns is essentially the study of the *control of space* in the town and in its hinterland.

The Industrial City in Perspective

Christopher Hague wrote in 1984 that "the obituary of the large industrial city can now be written". When this is written, it will be acknowledged that industrialism is only *one* of the various features of towns worth remarking. We have to see in perspective the recent towns of Western Europe and the United States of America which represent respectively the industrialised medieval town in an agrarian society and the planned town located in an undeveloped countryside. It must be remembered that, as feats of building and planning, these are dwarfed by examples of towns in other times and other countries. A brief survey might help at this point. In antiquity there were many towns built as garrison headquarters to control the surrounding countryside. The model of planned but unfortified towns in the Roman Empire had been derived from earlier antecedents. Such colonial towns were revived in the thirteenth century when the *Bastide* towns were built in Gascony (on the Franco-Spanish frontier). When the Americas were

colonised by the Spanish, the Law of 1573 laid down the structure for towns, not only along the coast but also in the interior (this could be contrasted to the straggling British colonial towns in North America which were only along the coast). These were in grid-iron style, with a central plaza surrounded by the houses of the elite. (Was this the prototype for Sjoberg's category of the 'pre-industrial town'? See below). "The grid plan has been the mark of the founded town since ancient times. It produces an efficient circulation system and a distribution of equal, rectangular parcels". (Sutcliffe, p. 91).

In the seventeenth and eighteenth centuries, when European domination in South America, Asia and Africa was symbolised by planned cities, European towns themselves were adjusting to the needs of growing populations and of increased specialisation in occupation.

Medieval European towns had a central place (church or *kreml,* like the mosque in Middle Eastern towns) and surrounding quarters or *posad* (like *mahalle* in Middle Eastern towns). Most towns were surrounded by walls. From the eighteenth century, to the towns in Europe which had grown naturally were added *planned towns.* This was encouraged by the popularity in seventeenth century Europe of "town books" which included town maps. Renaissance interest in geometry was translated into laying out of small cities and parts of larger cities, in Munich, Berlin, St. Petersburg (modern Leningrad) and Vienna. Urban design here lost the comprehensive view of the colonial town and became increasingly concerned with monumental architecture, with formal street patterns to set these off. These ideas were carried out across the Atlantic when l'Enfant planned Washington in 1791 (it must be remembered however that by the time his plan was actually put into action in 1887, the town had grown literally along different lines!). This planned baroque city idea was to be carried further afield in the twentieth century in Australia and British India. In essence, therefore, planned towns were of two types over the centuries—(i) the Roman grid-iron and (ii) the Renaissance circular/octagonal. These were carried over in a surprisingly unchanging fashion despite changes in living styles, modes of transportation and the demographic size of towns.

A HISTORY OF URBAN STUDIES

1. In the West, till very recently, town and country-side were treated as dichotomous, and also as producing distinct moral values. *Plato* (427-347 *B. C.*) had seen the town as generating a superior culture but inferior values (Baroja). Many centuries later in a different context—that of industralisation—British poets and writers, followed by European, also saw the virtues of rural life as mirrored in the views of the town; the town spelt liberty (but also loneliness), progress (but also pollution) (Raymond Williams). Crossing the Atlantic in the late eighteenth century, this acquired the character of an ideology in praise of the rural, with *Thomas Jefferson* (1743-1826) as its chief spokesman. He convinced many of his fellow Americans that the *real* U. S. A. was the rural one, and that urbanisation was one of the decadent developments of the *Old World* From the middle of the nineteenth century, with the development of railways and industrialisation, there occurred a change in the USA seen in a sense of pride in the new industrial towns; these were regarded as the catalysts in generating increasing wealth, and as the locales of a vigorous bourgeois civic spirit by contrast to the sluggish conservatism of the countryside.

2. The period which generated most literatures in Europe on towns, both analytical and fictional, was the hundred years from the 1840s to the 1940s—not surprisingly as this was the peak period of industrialisation and therefore, of urban change in the West. One by-product of the uneasiness with which people observed the rapid and uncontrolled urbanisation of the early industrial revolution was the desire to know about cities of the past, particularly the institutions that created civic stability. The pioneer of city theory. *Fustel de Coulanges* (1830-1889), wrote on "The Ancient City" (i.e. the Greek/Roman) (1864). He saw religion as the institution which integrated the family (in pre-urban society) and the city. It was its distinctive forms of worship that gave to each city its enduring character geographical boundaries and sense of independence. One long-term result of Coulanges' work was that henceforward it became customary to speak of 'ancient' towns as distinct from 'modern'; the next stage would be when the 'medieval' town would be described as yet another category, distinctive temporarily as well as in attributes.

3. The reaction of *Marx* (1818-1883) and *Engels* (1820-1895) to industrialisation was to see it as a part of the grand process, which made it possible to control the future. 'Engels' horror at what he saw of industrialising Britain and his own observations of the commercialisation of agriculture shaped Marx's writings on the city and the country. He saw these as antithetical, and the first as living off the other. (Incidentally, Marx's writings have seldom been referred to by American writers on urbanism, till very recently). "The town is in actual fact the concentration of the population, of the instruments of production, of capital of pleasures, of needs while the country demonstrates just the opposite fact, their isolation and separation. The antagonism of town and country can only exist as a result of private property" (*German ideology*, 1846).

To Marx, as to many contemporaries, town and country were distinct, a difference created by the division of labour and the appropriation of the surplus. "The whole economic history of society is summed up in the movement of this antithesis". (i.e. the separation of town from country). "Ancient classical history (i.e. the Roman, discussed by Coulanges) is the history of cities, but cities based on land-ownership and agriculture". The collapse of Rome had led to a return to individual peasant agriculture in Europe, to be followed by the next stage, the urbanization of the countryside when merchants living in medieval towns invested capital in the rural hinterland. This continued into the growth of the great cities of the Industrial Revolution. Ultimately, Marx side-tracked the dichotomy of town and country, and saw both as parts of the current system of production. The city represented in a concentrated form the evils of capitalism; it also however, by concentrating workers in a restricted area provided the condition for the development of the labour movement that would overthrow the capitalist system. The strength of these writers lay in the dexterity with which they united sociology, history and economics before they diverged again, to come together only a century later.

(Marx's ideas were to appear in a new incarnation as the persuasive hypothesis of 'parasitic' and 'generative' towns of *Hoselitz*, Marx's theory of rent was given a specifically urban context over a century later by *Harvey* and *Castells* in their writings which saw urbanism in terms of land values and a struggle for control of the best land. Thus the ideas of one thinker, writing at the time industrialisation was transforming European society, get modified at a time when industrialisation has become more widespread, population was increasing, and the pressure on urban land increasing).

4. The industrial towns and industrial annexes in Britain created many different reactions. Initially the ugliness of it all had created or reinforced a revulsion against the city (Blake in England, Jefferson in USA) and those who could afford it, moved to the country. In the later nineteenth century, particularly after the triumphant Exhibition of 1851. British industrialisation had become equated with national propsperity and imperial glory. This meant that industrial towns were sought to be given a special status by glamourising the city centres, and by clothing railway stations and houses of commerce in grandiose architecture, which again looked back to Roman and gothic traditions rather than seeking to create new styles. Thus grand city centres had screened of the unpleasant areas of industrialisation and workers' houses and postponed the need to do something about the poor. Further procrastination became possible in the last quarter of the nineteenth century when the better-off moved out to the suburbs, a move rendered desirable for sanitary reasons and made possible by speedier transportation. This happened in Britain and the USA initially.

There is a strange mismatch between the enormous volume of *literature* in Britain analysing and suggesting remedies for the problems of the urban poor (Charles Booth, the Weebs) and the actual *steps* actually taken for this.

In Europe, the small walled medieval towns were initially surrounded by *faubourgs* (*faux-bourgs*-false towns) which became integrated with the towns when the walls were demolished. The simultaneity of the British Industrial and the French Democratic Revolutions created a stereotype of the urban poor as *"classes laboureuses et dangereuses"* who should be tamed—either by providing amenities for them or by preventing them assemblies in protest, and paralysing troop-movement by setting up barricades. The second led to Haussmann's reordering of central Paris is the 1860s, a process of city redevelopment where considerations of security against excessive concentration of population were allied to aesthetic arguments to cut boulevards through the crowded areas, in a pattern resembling the boroque city of earlier centuries, but on a bigger spatial scale. Similar considerations of security, health and administrative streamlining led to much destruction in the name of 'improvements' when the French occupied the city of Cairo in the early nineteenth century. The blight seen in Toledo in the seventeenth century was seen in Cairo in the nineteenth. It is significant that this did *not* occur in the towns of Hispanic America, for three reasons :—(i) the problem of the poor pushed out from agriculture and knocking at the doors of the town had been present from the beginning, and the towns had been designed by the coloniers to *keep them out;* (ii) the initial planned city had taken up *more land* than had been necessary, so that there was room for infill; (iii) there was *no industrialisation* in South America.

In the 1890s, British towns found great satisfaction in the numbers game—in seeing who had the pride of place in demographic terms. The prospect of continuous growth was accepted uncritically and by most people as inevitable and even as desirable. Only later did it seem that this was not necessarily so. ['The Heaviest Man on Earth may derive consolation from his supremacy; but he deserves commiseration rather than congratulations. And so do the swollen cities when the consequences of their magnitude are understood' (*New Towns,* p.4).].

In England, in the 1890s *Ebenezer Howard* (1850-1928) developed the idea of the 'Garden City' to bridge the gap between industrial towns and rural countryside. His 'garden city' was not a Vienna or a Washington but the greening of an industrial city. His ideas were patronised by the industrialists, Bournville and Cadbury.

A contemporary of his was the brilliant and original Scotsman *Patrick Geddes* (1884-1932) who combined theoretical analysis with practical planning. He convinced people of the wisdom of conducting town surveys before drawing the lines of the redevelopment (something which Haussmann had obviously not done). His service to non-European countries (India and Palestine) was very great, as we shall see below (six).

6. In Germany, industrialism came later than in Western Europe, but it was here that comprehensive town planning was introduced first. These measures were to be copied by Britain (Town and Country Planning Act of 1909) and other European countries, and later by countries elsewhere.

In Prussia (which became part of Germany in 1871), there was an interesting difference in the nineteenth century between the *legal* and the *Census* definition of towns. In the latter the minimum number of inhabitants required to constitute a town was 10,000 in 1808, increased to 100,000 in 1871. In England, Howard carried weight when he said that the optimum size for a town should be 32,000 and that rather than indefinite suburbanisation there should be a policy of laying out *new towns*. Thus, Britain's town planning followed from Howard and Geddes, not from writers like *Charles Booth* (1840-1916) and the Webbs (*Sidney Webb*, 1859-1947, *Beatrice Webb* 1858-1943) who had been concerned about the misery of the 'other half' in towns. In the 1920s, drawing lessons from Western Europe, the USSR launched a policy of modernisation via industrialisation via urbanisation, by founding a network of 800 towns. Planned towns, therefore, became in the first half of the century an adjunct (Britain) or an alternative (USSR) to market-based urban development.

7. *Max Weber* (1864-1920) was, like Coulanges, to emphasize the ancient city in his *Die Stadt*, a definitely culture-biased work written in a period of crisis (1918-1919). Western cities are contracted with those of antiquity and those of the 'Orient'. A urban "community" in the full meaning of the word appears as a general phenomenon only in the Occident. "To constitute a full urban community—settlement must display a relative predominance of commercial relations, with the settlement as a whole displaying the following features: (1) a fortification; (2) a market; (3) a court of its own, and at least partially autonomous law; (4) a related form of association; and (5) at least partial autonomy and autocephaly, thus also an administration by officials in the election of whom the burghers participated.... Measured by this rule ..... the 'cities' of the Occidental Middle Ages only qualify in part as true cities". It is not surprising, then that he should have concentrated on the western city in antiquity and the Middle Ages only. As the American editors of his writings remarked, "Weber's theory of the city .... leads to a rather interesting conclusion. The modern city is losing its external and formal structure. Internally it is in a state of decay while the new community represented by the nation everywhere grows at its expense. The age of the city seem to be at an end". To Weber the distinctive features of an urban community were its autonomous law and partial political autonomy (like the English jurist Maitland who in 1898 described the borough community as different from the village one in that it was a corporate body). Weber held that the modern city was too large to be any longer the basis of human association.

8. *Henry Pirenne* (1864-1935), the French historian writing *Medieval Cities* (1925), found commerce the most essential ingredient of urban life, and the "class of men so specifically and strictly urban as.... the medieval bourgeoisie", and city law as the essential features of the medieval European city. What Coulanges did for the "ancient" city. Pirenne did for the "medieval". Feudal lords and merchants he saw as distinct social groups with divergent economic interests. The victory of the merchant middle-class led to the emergence of a new urban culture in place of the one dominated by the Church. Recent research suggests that, while 'new men' might have taken the initiative in exploiting the new techniques or markets, in order to expand their activities they co-operated with the rich older families rather than came into conflict with them (Hibbert).

9. *Werner Sombart* (1863-1941) *(Der Moderne Kapitalismus* 1916-17) saw "ancient" cities as primarily centres of consumption, which by consuming more than they could afford the fostered growth of capitalism.

Weber's contemporary, another German philosopher, *Emile Durkheim* (1858-1917) saw the concentration of people in the town as accelerating the division of labour (as did Marx) but as destroying the bonds of traditional morality (in agreement with Weber, but not at all with Marx who saw class relations as always productive of conflict, not, as Weber did, in functional terms).

10. It was inevitable that the creation of stereotypes for the "ancient" and "medieval" city would be followed by one for the "modern". It was equally inevitable that the American city would be used to shape a paradigm—the American city of the 1920s, before it was affected by the great Depression. This was the symbol of industrial success, untroubled by class tensions and growing in a orderly fashion under the beneficial effects of the civic reforms of the Progressive era. It was the American city that was the basis for the ecological theory of the city, the work of Chicago sociologists

(Robert Park) *The City,* 1985 ; R.P. McKenxie. "The Ecological approach to the study of the human community", *American Journal of Sociology,* XXX, 1924 ; E.M. Burgess, "The Growth of City", the *Proceedings of the American Sociological Society,* 18, 1923). The American interest in urban phenomena, however, has a longer history. In the United States of America where laissez-faire polity, capitalist accumulation as well as urbanisation was at its most spectacular from the 1880s, the continuing hold of the Jeffersonian view that democracy is badly damaged by urban conditions was seen in the work of Delos F. Wilcox. The title of his book is self-explanatory—*The American City : A Problem in Democracy* (New York, 1904). The city by imposing certain social norms on all its inhabitants and by the accumulation of great wealth in the hands of the view damaged the spirit of Amercian democracy. (It is worth remembering that Weber was a citizen of the top-heavy German Empire whereas in America grassroots democracy was still a living tradition. Another aspect of the specifically American urban malaise was seen in W. B. Monroe's book. *The Government of American Cities* (1926) which saw the root of the civic problems lying in the city's legal position as a corporation with an artificial personality against which the individual citizen was powerless. The novelty of the "Chicago School" lay in the use of the term "human ecology". The term "ecology" had been coined for a branch of biology in 1869. Park claimed that the community should be studied as a specific fact to understand it as a social phenomenon. Ecology was at once narrower and broader than sociology. In the narrow sense it was the study of the response of human beings to their environment ; in its broader sense, it claimed to be "a general discipline basic to all the social sciences". Park (1864-1944) held that the city was a reflection not only of political and conscious choice, but also of demography and distribution of space. The civic community gets modified by the differentiation of functions. When the struggle for existence establishes an equilibrium, the cultural aspect of human organisation develops. The ecological pattern of the city is determined by the outcome of the conflict between different functional groups for space at the centre of the city. Burgess categorised five zones in a city—the central business city, the transitional zone, the artisanal zone, the suburban and the commuter zones. The bibliography for the Park-Burgess-McKenzie book *The City* (1925) was put together by *Louis Wirth* (1897-1952), who was to write an article "Urbanism as a way of Life" (1938) where he argued that urbanism should be seen from three angles—as a physical structure, as system of social organisation and as a set of attitudes. Underlying this was the implicit assumption that urban growth, industrialism and modernism were inter-related. In other words, he created *an ahistorical unicultural* (i.e., North American) *stereotype*. He was not alone, C.D. Harris, and E.L. Ullman, in "The Nature of Cities" (1945) spoke of three categories of towns—central-place towns, transport towns and specialised-function towns—again chiefly derived from the U.S. example. The historian author M. Schlesinger (1940) saw American history as a conflict between rural and urban interest. (In the American mind, rural=the wild west, and urban -the culture of New York). He explained as being due to urbanism what in fact was due to industrialisation and technological development (E.E. Lampard, 1961). Before the end of the Second World War there were three major attempts to devise a model for the industrial city ; the concentric zone theory of Burgess, the centre theory of Hoyt and the multiple nuclei theory of Harris and Ullman. The same writer adds that since the Second World War there had been very few such attempts to classify sections of the city in this way. The last chapter in the work of the Chicago School had been written by Wirth (see above). This set out three concepts—size, density and hetero-geneity—as the key feature to which all aspects of city life could be related. Contemporary with Wirth and notable for being the first to move away from the USA, was Robert Redfield who also saw the city as a key variable, but with heterogeneity and lack of isolation as its main features (1941). Janet Abu-Lughod and Tomlinson were to criticize the ecology paradigm ; ecology cannot be regarded as scientific, since different people reacted to ecology differently. How persuasive the ecological theory has been is seen in writings on other towns. Only very recently has the absurdity of it been pointed out. "Somewhere between the cosmological past and the modern present" writes O'Connor, "Scholars lost the South-east Asian city and put Chicago in its place". In India, Sovani (1966) warned that "The U.S. is unique, and comparisons with her cities have to be made with great caution".

11. While some sociologists were analysing urban geography, geographers were offered an attractive theoretical statement about *sizes, spacings, functions and grouping of functions* in the central-place theory by Walter Christaller (1893-1969) in 1933. This pointed out that the "pull" of a centre is proportional to mass (purchasing power or disposable income per capita multiplied by population). This was supplemented in 1939 by Mark Jefferson's. "The Law of the Primate City" (*Geographical Review,* 29, 1939) which argued that in many regions the largest city attracts the greatest proportion of the region's population. It was left to the Dutch to show how this was far from a universal rule. Since primate city theory is not at all applicable to the Netherlands (H. Schmal, 1981). Zipf and Stewart (1947) formulated an alternative "rank-size rule" which stated that in any region there is a tendency for a city of given rank to have a population in

inverse ratio to its rank. Bilbert Rozman, a sociologist, used these theories to study the history of urbanisation for less well-documented areas like China, Japan and Russia. He deplored the fact that "the craft of periodization stagnated during the second quarter of this century" and identified "a unilinear process that provides a basis for designating successive stages of pre-modern development", an approach derived from central-place theory Rozman proceeds to study urbanization and even urban morphology in terms of the size/level (i.e., demographic size) of the towns. Critics have protested that levels based simply on population data do not constitute a coherent functional hierarchy (Wheatley).

12. The Second World War did on a huge scale what minor catastrophes like the Fire of London of 1664 had done. The enforced *rebuilding of many towns* posed basic choices with regard to the old city, housing extensions and satellite towns. There can never be any total agreement on the best forms of the modern city, but in many cases there is a happy mixture of the old, usually restored and refurbished, and the new, and a concern for all sections of society and of age groups. In today's London, Paris, Heidelberg and Warsaw, there is clear evidence of a respect for earlier mores, earlier building styles and earlier scale, in other words, for the town's historic past not as a museum piece but as an integral part of the total city. The trauma of the War led Europeans to seek solace in recreating some of the elements of leisure and stability of earlier times.

13. Even so, the western, particularly American priorities in industrial development manifested in the growth of large towns led to the identification of urbanisation with "modern" values. This led in the 1950s to creating yet another stereotype pair—*"colonial"* and *"traditional"* (an update of the Webrian dichotomy between Occidental and Oriental) in which the former were endowed with western values and were "beach-heads" of western culture. The myth of the colonial city is a habit which dies hard. Rhodes Murphy, an American writing in 1959 can be laughed away, but an Indian sociologist writing in 1986 is using very similar language "On one side these cities developed as an exploitative mechanisms.. while on the other, they also helped to introduce freedom of thought" (Khopardekar). This sociological viewpoint carries over to other disciplines and thence to the practice of town planning. If the Europeans had erred by giving the colonised only half-measures in industrialisation and in urbanisation, it was seen as the duty of the inheritors to complete the task. Leaving aside well-meant if unintelligent patriotism seeking to garb their towns like their economies and life-styles in a twentieth-century Western European –U.S. manner, there is a lack of historicity about the equation of modernism with colonialism and then with a century of developments which have occurred in one part of the globe. It also leads to the tendency to seek to identify the groups of people or rulers who "brought urbanism" to a particular area—for example Indians in South-East Asia, the Mughal in India and the Europeans in Africa (Ginsburg talks of the "extreme youth" of the towns of the South-East Asia !). One reason for the ahistoricity in looking at towns in the pre-census centuries is the absence of information with regard to size. But as more information comes to be gathered and disseminated the dichotomies are breaking down and the elements of traditional/precolonial are seen to persist today, and many urban features of the precolonial period are being appreciated.

14. While in the 1950s urban studies were in general moving from the universal to the particular, another great achievement in "typologising" appeared—Sjober's *The Pre-Industrial City* 1960. He created a residual category into which all cities that do not fit the current western patterns are put. (E. Jones). In terms of urban morphology this stereotype holds that the central plaza has a market, a religious building and an open space (this is *not* a central business district). Social groups are segregated, with the elite living near the centre and the lower castes at the periphery; segregation is by ethnic and religious differences or by occupation. Over time markets grew, and with markets, the division of labour. Communications are erratic both within the towns and between towns. Land-use is the result of economic competition. It is symbolic as well as utilitarian, but the impulses are based on political and religious rather than economic criteria.

Sjoberg's assumption has been internalised by many writers without sufficiently questioning whether all his premises are tenable. Like the false dichotomies between archaeology and architecture, between anthropology and sociology, Indian urban geographers and sociologists have created yet another—the "traditional" city (equal to Sjoberg's pre-industrial) and the "modern" (equal to North American). The first is ahistorical and the second is exotic. If the diagnosis is wrong the prescriptions will also be wrong.

Towns can be parallax or palimpsest. If we abandon the dichotomy between traditional and modern towns, we can see elements of both parallax and palimpsest in old towns like Delhi or Lucknow where European rule has been imposed, and indigenous elements in colonial towns like Singapore and Calcutta. There is a qualitative difference between earlier towns and European colonial and colonised towns. This is the spatial extent. The European-controlled towns were federated ones. Just as, in earlier Spanish American towns, European areas were set apart for reasons of security, so

also in Asian towns old Indian/New Indian/ Chinese sections were spatially distinct. This meant that the unitary character of older towns was lost just as in European towns, industrial areas and residential suburbs were federated to the medieval city. In terms of social cohesion and local government such conurbations created problems. For purposes of comprehension. Asian towns are perhaps the most difficult to understand. European towns are largely unicultural, American towns are alike in their relative youth and spatial format, Spanish American towns are alike in their unequivocal ethnic apartheid. Asian towns with strong local traditions on which colonial urbanism and western finance capitalism have been imposed are facing the greatest problems for the analysts.

15. In looking at non-Indian situations, it could be suggested that it is not the American examples which are most relevant but *the West Asian, South-East Asian, Chinese and East European.* In all these there have been the clash/coexistence of different cultures and ideologies. In all of them there are towns with a long ancestry (unlike the USA), in all of them urbanisation and total urban populations have increased rapidly in the last fifty years and in all of them for some years now American/ Western capitalist ideologies have mesmerised planners and architects. The chapter entitled "Whither the City : A Prognosis" at the end of Janet Abu-Lughod's *History of Cairo* has relevance to India. The problems that she highlights for the 1960s are : (i) How the city is to be governed in the face of the traditional lack of corporate identity; (ii) How the city is to be kept from deteriorating in the face of heavy demands from the increasing population; (iii) How city building is to be planned ; (iv) To what extent housing should be given priority ; (v) How the problems of congestion can be handled along with seeking to develop balanced regional economies.

It is also worth remembering that "while there are common underlying tendencies, urbanisation in developing countries today is proceeding far more rapidly than it did in developed countries in the past compared with improvements in the socio-economic indicators" (Lichfield). For these divergences he offers different explanations: (i) Many developing countries may be "over-urbanised" for their state of economic development ; (ii) In developing countries, political developments are forcing socio-economic changes whereas in Europe economic change had been a catalyst for political change; (iii) A greater consciousness of the aims of more equal distribution of wealth and economic efficiency creates increased urbanisation ; (iv) Planning at the national, regional and local levels is far more important than it had been in West Europe. Weitz (1971) has warned against the belief that building large cities will guarantee economic progress. Developing countries are particularly prone to this misconception, often inherited from their past colonial history. Urban and economic growth should not be confused, and unchecked urban growth may even lead to economic collapse. He argues that "instead of old ones, new theories are required that will apply to the developing countries, as well as new techniques to inter-relate economic growth with urbanism in a meaningful and effective manner". The work of Mabogunje reflects the disillusionment of thoughtful Africans ; there had been a strong belief in urbanisation as a panacea, but it has only created more inequalities than before.

The increasing study of Asian and African towns and urbanisation has led to a reaction in Western Europe and in North America against the hagiographical studies of urbanisation. In the 1960s this has come in the form of a new variant on the argument of Marx a hundred years previously. The town is being seen by sociologists and geographers as an instrument for the capitalist domination of space. This obviously has tremendous implications for urban studies in lesser developed countries. The work of David Harvey and of Castells should be studied by Indian urbanists more seriously than the work of the Chicago School, Sjoberg, Redfield and Singer.

To conclude, it has been shown that in the last century-and-a-half, there has been a vast literature on urban questions particularly in Western Europe and in the USA. Town and country are seen as dichotomous. Stereotypes of 'ancient', 'medieval' and 'modern' towns have been created, each firmly based in a time-place context. Industrial growth was a matter of pride but also for concern, and planned towns, a feature of the ancient world and of colonised areas, was extended to the Old World too. The shock and destruction of the Second War hastened a reaction in favour of the economies of scale of towns as they has been before the transport revolution. Urban renewal has meant that total planning is now regarded as undesirable. In India there is a tendency to accept these notions of town-country dichotomy, culture-based typologies and the inevitability of the "modern town". The study of urbanism in India which follows (Five) will be a corrective.

CHAPTER 5

URBANISM IN INDIA TILL THE 1870s

THE DISCOURSE

"Somewhere between the cosmological past and the modern present, scholars lost the South-East Asian city and put Chicago in its place".

R. A. O'CONNOR. *A Theory of Indigenous South-East Asian Urbanization.*

The situation in the discourse on the Indian city is almost as deplorable. An architectural historian, an anthropologist and a sociologist will each have much say about Varanasi for example, but the perceptions of each will be so different as to make it difficult to realise they are all speaking about the same town. This is partly caused by unsatisfactory history-writing, and inadequate available information.

Traditional/Modern

1. When Robert Crane used the terms "traditional and modern urbanisms in India" (Crane 1955) this could be forgiven in an American, but when the same is used by innumerable Indian geographers and sociologists (e.g. S. Saxena 1981) it means that this dichotomy has been internationalised without question. The division used here ('Indian Urbanism till the 1870s' and 'Indian urbanism 1870-1980s') is not because the former is considered as equivalent to 'traditional' and the latter to 'modern' but because, in this author's belief, most of the problems of town-planning being encountered today are the creation of the past century, and due to a lack of comprehension of the ingredients of the urbanism that preceded it.

Typologies

2. Perhaps the most comprehensive is the list given below (Olsen, in Fraser and Sutcliffe, p. 264):—

City as fortress	City as Temple
City of Palace	City as monument
City as Salon	City as Toy
City as Factory	City as barracks
City as Office	City as School
City as Machine	City as Revolutionary Cell

For Indian towns, the standard typologies have been :

City as Capital
City as Fortress
City as Temple
City as Market Place Port

(Further refinements can be found in Richard Fox's book.) This is fairly limited, but it becomes misleading when the categories are considered mutually exclusive. A 'temple town' can be a flourishing market-town, a fortress is often a capital. (Gupta 1983).

Chronological Categories

3. "We must synchronically distinguish urban complexes in India according to their particular cultural traditions and diachronically according to ancient medieval or modern urbanisms" (I. P. Desai and Y. B. Damle). We have just seen (Four) that in the European discourse ancient = Greek (emphasis on administrative and aesthetic aspects), medieval feudal European (emphasis on economic and social factors) and modern = industrial (emphasis on economic organization) but apart from the aspects emphasised there is a wealth of research and information on all aspects of urbanism in the western world. For India, the dangerous and simplistic periodisation of history and therefore of urbanism into ancient = Hindu (emphasis on social organisation), medieval = Muslim (emphasis on cultural aspects) and modern = colonial (emphasis on economic and administrative aspects) has meant that there is very little research done on aspects of urbanism other than those emphasized.

Regional Categories

4. The history of South India tends to be written separately from and usually as a post-script to northern Indian history. This has led to patterns of urbanism also being regarded as separate and distinct. This is seen in the *Cambridge Economic History* Vol. I which consistently discusses north and south Indian towns as distinct. This means that port-towns like Surat are categorised as *northern*, and Masulipatnam as *southern*, where in fact there may be a resemblance between different coastal areas (of Braudel and the ongoing research on Mediterranean towns).

A. THE EVIDENCE

The very long period of Indian history and proto-history puts Indian urbanism in the category of Mesopotamia and Egypt for *antiquity*, and of China for *continuity*. This

continuity has been caused by ecological factors favouring the urban centres, which have prevailed over political changes. There are many gaps in our state of knowledge, but it is no longer assumed that lack of *archaeological evidence* indicates lack of urbanism. Destruction, wanton or natural, has deprived us of much evidence.

B. WRITINGS ON TOWN PLANNING

(i) These have been treated as Sanskrit literature, and the ritual genuflections to the Silpa Sastras in the introductory lectures on planning and architecture are never followed up in practice.

(ii) It is now known that such treatises exist for a later period than was known earlier, and in languages other than Sanskrit (Tillotson 1987, G. K. Pillai 1948), which testifies to their being in use for longer than was supposed.

C. ETYMOLOGY

As in German, the use of *bau* for 'town' as well as 'field' means that it implies 'demarcated space'. In Indian languages, too, many words pertaining to towns are open to 2 interpretations:—

1. Mandir : temple/house/town
2. Nagar : temple/house/town
3. Pura : Shelter surrounded by (wall Dravidian pre-Aryan)
4. Thirtha : Place of pilgrimage near water/town
5. Kshetra : Sacred ground/city
6. Palli : village/town

Pattinam, shahar are more specifically urban areas. It is suggested (B. D. Chattopadhyaya, 1986) that a hierarchy is implied in grama/nigam/pura/nagara/mahanagar. Another hierarchy is of (Kramrisch 1946) grama/khetaka/kharvata/dunga/nagara/rajadhani (village/hamlet/market town/fort/town/capital).

Note—S kha-nagara meant Branch of a town (=suburb.)

Yet another is gama/nigma and pattana/gama/panya pattana (a village growing into a town), a village on a river becoming a major port) (Bongard-Levin, 1985, p. 128).

D. HISTORY

Phases of Urbanisation :

1. Harappan 2500 — 1500 B. C.
2. Early historic 500 B. C.
3. Early medieval 1100 — 1300 A. D.
4. Medieval 1450 — 1800 A. D.
5. Modern 1830 — present day.

1. Harappan

Much research has been done on Harappan urbanization since the first evidence of these towns was found in the 1920s. The close links of these towns with Mesopotamia is not reflected in any similarity of urban patterns, and the sophistication of the layout of Harappan towns seems unique. They have identifiable citadels, and streets of houses (built of brick) which appear to be of both rich and poor. These towns were encountered in a rich agricultural river basin and were 'gateway towns' which channelled the produce of Central Asia to West Asia; the granaries at the site and the seals indicate both aspects.

2. Early Historic

The links between Harappan culture and the Aryan is still hazy. The term 'purandhar' and 'purabhida' (town-destroyer) used for Indra suggests that towns were ravaged in early encounters between the incoming and indigenous people (R. K. Mukerji). It has also recently been suggested (B. D. Chattopadhyaya) that much of the 'wisdom' of Aryans was in fact based on knowledge acquired from earlier cultures and transmitted, often without the appropriate context. An example is the details of burnt brick altars found in the Vedas which correspond not to anything in Vedic archaeology but to Harappan excavations. This is very likely to have been the case also with concepts of town-planning and city design (Amita Ray, 1964). "The *Mandala* (establishes) a field of Vedic deities in a non-Aryan landscapes" (J. Smith 1976). 'The textbooks of Vastushastra.... are records of oral traditions which go back into an undefined past'. (S. Kramrisch 1946). The craft of achitecture can be assumed to be pre-Aryan, since Viswakarma was a pre-Aryan god. though the Rigveda makes frequent reference to the *vastupati* (the lord of the abode). The Sthapati (architect) was a lower caste person, though he was given princely status for some rituals.

The longevity of towns in this period is remarkable. The best example is Pataliputra, the grandeur of which excited comments from the 3rd century B. C. (Megasthenes) to the fifth (Fa-Hien). There is also a lack of agreement as to whether the Arthasastra (of Bongard-Levin and Trautmann) which contains detailed instructions about town layout, house-building and urban government, was written at one time or over a period stretching from the 6th century B. C. to the early centuries A. D. The latter would explain the fact of Texila in the Indus Valley, which was at its 'peak in the 4th century B. C., being a classic example of a planed city. There is no reason to assume it was exceptional simply because archaeology has not yet yielded up many other towns in that region. In the Ganga Valley Kausambi (where the fortification are very similar to the Harappan). Pataliputra are examples of a

planned town. In the east, Sisupalgarh was a town built on the mandala pattern in the west Ujjain. Whatever the facts about the Arthasastra it is clearly the first detailed treatise on the subject. In the Mauryan period it is supplemented by descriptions of urban life and of buildings and of urban administration, in other literary sources. The Arthasastra, and Panini's Ashtadhyaya are far more than their titles suggest — the information they contain make them a combination of encyclopaedias and work-manuals. The Arthasastra gives details of the royal fort and other buildings, the manner of selling plots of land and the rules for building houses, the duties of the city superintendents. Panini gives details of the construction of fortifications. The Arthasastra and later Silpasastras offer many alternative designs for towns, all of them elastic enough to allow modifications. The relative position of monumental architecture and areas to be inhabited by different occupational groups are prescribed. The link between the palace and the temple is clearly planned as the beginning (Kramrisch, I).

Provision was made for increased population. "The population increased in number and the ruler was confronted with the problem of relieving congestions and consequent measures of extension. He caused a resurvey of the limits of the old city to be made from a study of the ancient traces with a view to preparing a fresh and comprehensive town plan which, while satisfying the present needs of growing population, would also make ample provision for future extensions of the city and secure..... the possibilities for artistic and harmonious development of the town from within". (Ayyar). There is a description of the extension of the town of Dwarka by pulling down the city walls and by filling the moat (Dutt).

In early Indian towns it appears that revenue-collectors as well as commercial groups organised in guilds were present, i.e. these two categories do not represent 2 typologies, as in ancient and medieval Europe (Finley, Chattopadhyaya). The complex urban society was controlled by laws which had a remarkable range of urban controls, so that services were provided and social tensions created by unintelligent urban settlement averted. The mayor of the city (the *pura mukhya*) was not an independent official but was subordinate to the *Samaharta*. The *pura mukhya's* duties included inspecting the city's water supply, the conditions of roads of the city's grounds, and its defences. Along with his subordinate officials a system of mutual checks and balances was created by which the community was enabled to live in comfort and in harmony. (Perhaps modern municipal administrators in India would do well to read these descriptions along with the municipal bye-laws which are in operation today, which are basically carbon copies of British bye-laws made for English cities in the 19th century).

The growth of towns led to the formation of an attitude towards urban life and towards townsmen. Whereas the *sutras* sometimes referred to the towns derisively..... the *Arthasatra* and the *Puranas* describe the city as the backbone of a state (Bongard Levin, p. 129).

Megasthenes described Pataliputra in the 3rd century B. C. in glowing terms, comparing it favourably to Susaan's Ecbatana. As a wordpicture, Milindapanho's description of SAGALA in the 1st century A. D. can hardly be bettered: "There is in the country of the Yonakas a great centre of trade, a city that is called Sagala, situated in a delightful country, well watered and hilly, abounding in parks, groves and lakes..... Wise architects have laid it out, and its people know of no oppression.... It is brave in its defence, with many and various strong towers and ramparts, with superb gates.... and with the royal citadel in its midst, white-walled and deeply moated. Well laid out are its streets, squares, crossroads and market places....It is richly adorned with 100s of halls of various kinds and splendid with 100s of 1000s of magnificent mansions which ride aloft like the mountain peaks of the Himalayas.— The city in the resort of the leading of each of the different sects. Guilds of traders in all forts of finery display their goods in the bazaars, which face all quarters of the sky" (R. K. Mukerjee, 1959, p. 133).

In an intuitive but profound remark Sister Nivedita said (*Civic and National Ideals*) that while the Mahabharata was heroic and national, the Ramayana was personal and civic. In the descriptions of Ayodhya and Lanka there is a sense of civic identity which is very marked (as when the goddess say "I am the City of Lanka") and of civic pride (as seen in the lyrical descriptions of Ayodhya). This would reflect the spirit of the time in which the epics were composed, as well as the time of later interpolations. By the early centuries A. D. life in towns both in north and south India (Ujjain, Madurai) was described vividly, indicating a distinct urban culture. *(Silappadhikara, Kural* and *Maduraikkanchi*). This is exampled in the *Mrichhakatika* of the first century and in Kalidasa's writings in the Gupta period (4th and 5th centuries).

By the 6th century A.D. the Silpasastras and Manasara had been written or compiled. These were to be the basis for much subsequent writing on building towns and on architectural details. In the *Kamikagama,* a Southern Indian text, 60 out of 75 chapters relate to town-planning. These have been transmitted through subsequent centuries, modified and translated.

They also were internalised and transmitted orally, so that they formed the basis of artisans' skills even while the texts were quite unknown to them. The English rendering of these texts was done at the request of the British in 1834 (Ram Raz) and 100 years later, many translations were published (Acharya, Dutt, Pillai, Chatterjee, Dagens), Architectural skills remain in evidence till today, but the complementary skills of town planning and town governance which depended on the ruler, was not always carried out with the thoroughness suggested by the *Arthasastra*.

3. Early Medieval

The period from the end of the Gupta Age till the 12th century was regarded as a period of deurbanisation (R.S. Sharma). But recent research (B.D. Chattopadhyaya IHR 1974) has shown that while some political centres lost out, others were enduring, and many new ones were established. Townships which developed independently of royal initiative include Tattanandapura (the city of goldsmiths). Urban concentrations/trade/artisanal prosperity/political control were not all continuous. The high peaks of primate towns seen in the Harappan, Maurya and Gupta Age was to be seen again in the 12th century in north India. But this does not mean that urbanism declined drastically between these peak periods. For the south, the urbanisation of the Classical age, from the 4th century B.C. celebrated in Tamil literature, seems to have declined only to revive in the 10th century, with political consolidation, at the same time as in north India.

The building industry throve in this period (70,000 craftsmen under Alauddin Khilji, 1500 stone cutters under Babar) and even where designs were exotic, the craftsmen were local. In the north, limemortar was used as cementing, and this enabled an increase in brick construction (*Cambridge Economic History, I.*). Temple construction was at an all-time high in the Chola Kingdom in the 11th and 12th centuries. In Madurai, Kanchi, Puri and other towns, the ritual of the temple-chariot shaped the cities. The towns of the Sultanate and of the Mughal Empire had certain elements of similarlity to towns in Persia and Central Asia—mosques, *maidans, sarais*, fortified palaces and processional avenues. Each of these features had Hindu equivalents and a town like Vijayanagar combined elements of both, architecturally and in terms of features. Settlement patterns varied in the sense that in Sultanate/Mughal towns the estates of the big nobles contained *karkhanas* (as in Iran) for service-personnel. Whereas in other towns, settlement was more formally on the basis of caste. Another difference was that towns controlled by nonlocal rulers were usually fortified. They were often linguistically and culturally different from the rural surroundings. In towns that were laid out the broad avenues (for royal processions and for the temple chariot) were laid out, and the rest built by infill.

India from the 12th century was linked with the Middle East, Western Europe, and South-East Asia through trade. This meant that towns were (a) larger and (b) more cosmopolitan than before. Manufacturers in Karkhanas or attached to temples, also proliferated in Vijayanagara, the ruler was advised "Make the merchants of distant foreign countries who import elephants and good horses attach to yourselves by providing them with village and decent dwellings in the city" (*Cambridge Economic History, I.*). There are clear indications of suburbs developing (Banaras, Patna, Agra, Delhi) as well as of areas being formed into extramural wards by rulers—(Champakalakshmi and A. Das Gupta). Surat and Srirangam are two examples of towns with concentric walls. There are also examples of houses developing in ribbon-fashion along roads or rivers leading out from towns. (Patna). The size in population and area of many towns (Patna—200,000 in 1631, Ujjain with a circumference of 60 miles) (J. N. Sarkar 1987) compared favourably with large towns in the Middle East and with London. The wealth of the towns, was so well known (Shahjahanabad in the 17th century is said to have held 10% of the wealth of the Empire-Blake) and attracted marauders so that they were (often permanently) despoiled. But the number of cases of recovery is remarkable, which suggest an enduring prosperity based on trade, manufacture and pilgrim-traffic, as well as individual fortunes based on land and field.

There were also many instances of towns being laid out—fortresses on frontiers, *brahmadeyas*, *waqf* and *madad-i-meash* towns and *qasbas* (3,200 under Akbar), to create a network which was essential in an era of slow transport. As in the earlier period, there are examples of 'manufacturing' towns—Bayana (Indigo), Khairabad and Daribad (textiles) are examples. There are references to immigrants being settled in towns, or people of specific profesions being invited to occupy wards in towns. Abul Fazl stated that "A city may be defined as a place where artisans of various kinds dwell" (Blake 1987).

We have evidence of tension about the use of public space between sects of Hindus, or Shias and Sunnis, or Right and Left Hand Castes (this does not mean this did not occur earlier, but there is no evidence for it). Increased wealth, a population influx, uncertain political boundaries and therefore political fortunes made for rivalries at the administrative level too—governor V. Commander, Qiladar V. Kotwal. There was little evidence of the kind of conflicts between religious and secular authority as was seen in contemporary European towns (Champakalakshmi). Rather, the help of religious

authority was sought to sanction and legitimise secular authority. Sectarianism in religion did not create wholly segregated communities, and cosmopolitanism was apparent in life-styles. Where the urban dwellers were different from the local rural people, a sense of distinct adenity persisted, as seen in Hameeduddin's poem which indicates the town-dweller's dislike of the village (J. N. Sarkar) and his sense of distinct identity persisted, as seen in Hameed-(examples of poetry in the genre of Urdu Shair-Ashoob). Elsewhere, as in the Tamil or Maharashtra country, bonds between rural and urban people were close, and villages had similarities with the towns in terms of layout. The town was, often referred to as an 'enlarged village', a concept not meaningful in Punjab or the Doab.

Vijayanagar [Paes (c.1520), Cambridge Economic History, I, p. 122] "The size of the city I do not write here, because it cannot be seen from any one spot.— It lies between several ranges of hills. It seemed to me as large as Rome, and very beautiful to the sight; there are many groves within it, in the gardens of the houses, and many conduits of water which flow into the midst of it, and in places there are lakes".

4. **Early Modern**

From the middle of the 17th century, provincial capitals and ports developed. As the European penetration of Indian commerce increased, the foreigners were enclaved in 'factories' which were fortified to defend their persons and their trade, and those Indians who bought sanctuary with them—a different picture from that of older ports. In the 18th century, with the decline of Mughal power, there occurred a repetition of the peripheral urbanisation that had happened after the collapse of Vijayanagar in the 16th century. In the latter, fort-towns had proliferated; in the former, provincial capitals were set up at Hyderabad, Murshidabad, Lucknow and Bharatpur, Jaipur was exceptional in being a totally planned city, built with a leisure which the more hurried building of other capitals could not afford. From the 1770s, the 3 British settlements acquired the characteristics of city-states, with federated villages attached to the forts. The peculiar circumstances of the war and the penetration of the colonial state meant that these cities grew spatially and demographically large, by contrast to other towns which were more compact—thus recalling towns like Pataliputra. With revenue-collection becoming one of the main functions of British rule, district headquarters and later cantonments were located in concentric areas reaching inland.

'Colonial' cities proper were the 3 Presidency towns of Bombay, Calcutta and Madras. Others constituted 'colonised' towns, where the British presence was an addition to a pre-existing Indian one. A third category was inland towns created by the British needs for military security and sanatoria the cantonments and hill-stations. There is a basic common feature in all these—that as British power increased their physical distance from the Indians increased. The cluster of the Fort as in early days in the Presidency towns was not repeated. In these towns the English chose to live in enclaves of garden houses separated from their place of work as well as from the Indian areas. In the case of 'colonised' towns, English homes and workplaces were both in the enclaves of the 'civil lines', adjacent to the 'military lines' and separated from the 'Indian town'. In the Presidency towns there was initially some monumental architecture which was distinctive; in the first half of the 19th century, with energies and resources diverted to building up the empire, building became more utilitarian, so that the British presence was signified not by monumental visibility by segregation—segregation in hierarchical right-angled enclaves such as they had never experienced in their own country. This absence of integration into the indigenous urban morphology was to create a major modification in future morphology; twin towns (like Golconda-Hyderabad, and Hyderabad-Sikandrabad) had existed earlier, but not twin towns with different street patterns, housing and services. When unitary town government became thus a federated one, civic responsibility also got diluted. It is no accident that in the 19th century the towns of the princes were commented on favourably, while British Indian towns became increasingly shabby. Connected with the nature of the colonial regime, again, was the economy of the towns. For earlier periods of history, there is evidence of urban property being hereditary, but in the centuries preceding British rule, it appears that urban property, like agrarian, was revokable—with the increase of political security around the Presidency towns and the introduction of hereditary rights in property, urban land became real estate, and moneyed individuals bought urban land and adjacent village land for purposes of speculative building or for resale. The wealth in the towns, however, was not translated into the wealth of the towns, because the British were frightened off from levying house-taxes and had to fall back on octroi, where again major items were exempt. While the towns which had been simply administrative centres lost out in population, a new dependent urbanism related to the ports developed which was slower and where the towns were to be the points of attraction for distress migration from a burdened countryside.

Urbanism became polynodal in British India. The new government did not take on the function of a court, in the cultural sense or in acting as a patron for craftsmen. What it did do was to attract many individuals for the tertiary occupations that developed. The wealthy rentiers who lived in the cities patronised British education and lifestyles, but in most

cases combined this with traditional values and lifestyles. Therefore the use of the word 'modern' has to be used with the clear understanding that the indigenous people chose selectively from western civilisation (of MSA Rao 'Urbanisation and Social Change' in *Urban Sociology in India*). To think of British Indian towns as "beachheads of modernism" is naive. By the mid-19th century, urban sprawl and class divisions in the spatial sphere had become apparent, but these were not of the same kind as in Europe. The increased urban growth with the building of railways in the 1860s and 1870s was to enlarge the problems implicit in these features.

CHAPTER 6

URBANISM IN INDIA C. 1870—C. 1980

THE DISCOURSE

The century 1870-1970s has been, as we have seen (Chapter IV), one of increasing urbanization in the world and increasing notice of this fact has been reflected in a large output of written material. It has engaged individuals of various disciplines, and suggestions have been made which have often been translated into action. In India, the period till the 1930s produced some analyses of urbanism, many suggestions for improvement, and some actual activity. In the writings in India of the mix-1940s we can see a euphoria and a confidence that the immediate future could bring change for the better. From the 1950s there has been a spate of writing, which has become virtually an end in itself. In terms of the number of books and articles in a bibliography, the Indian collection can compare favourably with any European one. This was noticed by the anthropologist Colin Rosser in 1972 when he was asked to prepare a survey on urbanization in India. "If a summary of this torrent of words and mountain of paper is possible it would be that there is in India a widerspread *verbal* acceptance of the doctrine that *development* strategies are needed". About these writings, there are some caveats to be borne in mind.

1. A lot of exotic terminology is favoured, and comparisons are usually with the American/ West European situation only, as if these are a universal paradigm. (Van Huyck). This can be seen very tellingly in the large number of research monographs prepared at the time of the 1961 census, ('Objectives of Various Urban studies' in B.K. Roy—Burman, *An approach to Urban Studies in India,* 1967) with all good intentions but which did not, for most part, show realistic appreciation of the specificities of the Indian urban situations. Academic colonialism is much more difficult to shake off than political colonialism.

2. More and more work is being library-based, not rooted in ground-work and leg-work or even in archival records, so that they have a quality of distancing the writers from their subject. Remember Geddes! "The first problem of the town planner is to see the city before him.... Active peregrinatism is thus necessary; and this continued, day after day" (Stalley, p. 387). Rosser, in the report above referred to had looked forward to the National Institute of Urban Affairs as a hopeful portent and hoped that it would not become "another talking shop of the Delhi variety". It is perhaps too early to judge whether his misgivings were justified or not.

3. Theorizing and writing has been at the macro-level. This has implied a facile assumtion that what is good for Delhi will be equally good for Pondicherry or Nagpur, and this has led to much unrealistic planning.

4. Historians have been conspicuous for the very limited contribution they have made to the subject, so that, while urban sociology, urban geography and urban demography has much to show, urban history has relatively very little. This is what has allowed the persistence of an unintelligent "periodisation" which we have already referred to in Chapter Four, and which for the century under study, has led to the wrong equation of American modernization with urbanization and industrialization, thus leading our historians to contradict themselves by simultaneously accepting the detrimental consequences of British rule and Marx's belief in Britain as the "unconscious tool of history in modernizing India".

5. There is a great deal of plagiarism, conscious or otherwise, in these writings, so that there is much repetition.

6. There has been throughout the century a lack of clarity on the question "Who governs the town?", which, coupled with an absence of political will and of public co-operation, has meant that India has not yet got her Booths and Webbs (see Chapter Three) who will cry out for sanity in the face of increased industrialization and urbanization. In terms of town-planning, the alienation of the people from the planner and the unintelligibility of the planners' jargon has meant that there is a greater gap between theoretical planning and implementation today than there was between the Shilpa Shastras and their implementation. It is remarkable that the media have not ever thought of preparing a series on "Hamare Shahar" as has been done so well for Western towns. Seminaritis has been seen as a cure for the disease of urbanization, but is in fact becoming an ailment in itself!

HISTORY

1. 1870-1899:

We have seen in Three that this "Census" century has seen not only urban growth but a perceptible urbanization—i.e., an increase in the population of city dwellers to the total population. That this is also accompanied by a spatial increase is less commented upon and certainly very poorly documented. Several new categories of towns were added to the old towns

and to the three metropolitan cities—(1) Industrial and Manufacturing towns ; (2) Hill stations ; (3) Cantonments (Geddes' *Indore,* Volume I); (4) Planned capitals ; (5) Link-towns and Mandi or railway towns [cf (a) Ved Prakash's list, (b) Johnson's list of Cantonments, (c) Pokshishevsky's classification]. Existing towns also grew spatially and demographically. The latter is evident from the Census but the former is not always clear. (The aerial surveys of 1936 show clearly the federative quality of towns). From the end of the 19th century the contrast in density and layout between older towns, and British additions, as well as 19th century aggregations became increasingly pronounced. Susan Lewandowski has commented, "The British occupation made Madurai look like Madras—polydonal not unitary". But the "polynodal" disguised the inequality between the nodes in terms of resources available.

The British geographer Smailes in 1969 and in 1973 wrote what was to be the classic account of the morphology of a typical Indian town. Anthony King elaborated the differences between "Indian towns" and British areas in a very detailed book and suggested that the latter had elements of order and potential for development which the former could not acquire. Half a century previously, E.G. Richards who had been asked by the Calcutta Improvement Trust to prepare a report on the needs of town planning in Calcutta, had contrasted the orderly British areas with the "streetless pattern of the Indian sections. In all these accounts, there is a sense of incomprehension of Indian urban living. This could be summed up in the remark of the Italian architectural historian Petruccioli, "Disorder is order that we do not understand".

The considerations behind demands for regulating town growth in Europe had been aesthetic and sanitary. In India it was defensive and sanitary. The first had led, as we have seen, and increasingly in this century, to the open ghettoism of civil lines, cantonments and railway stations. The first and second together had led to clearances in towns in a manner reminiscent of Haussmann. (Gillion, pp. 126-70). From the 1860s Sanitary Commissions were formed in the three presidencies (J.C. Hume, "Colonialism and Sanitary Medicine", 1986). A fetish of clean air led to *cordons sanitaries* being maintained between older towns and British areas. The government was unwilling to spend on durable sanitary reforms, and in any case policies were deadlocked because of conflicting ideologies of officials. In the period of the first three Censuses the "growth" of towns seemed to be a matter for congratulation rather than worry, especially since this was explained in most cases by the growth of industries and therefore appeared to be parallel to Britain's demographic history from the 1770s to the 1870s. It was the plague epidemic of 1898-1907 which like the outbreak of cholera in Britain in the 1830s called for swift measures of sanitary reforms which implied town planning. "There was an absolute qualitative expansion in Bombay's economic activity and comparable growth in total employment and cost wage outlays. But the majority of Bombay's inhabitants' incomes fell in real terms, environmental and ecological conditions worsened for human habitation, crowding was horrendous and an ordeal of death tainted the development process. At least some of Bombay's experiences was paralleled elsewhere in the country. The distinction between economic development and, alternately, living standards was explored inadequately by the 'new revisionism' which ignored also effects beyond environmental decay and mortality, major flaws in that interpretation by that impact of modernizing activity... Bombay's masses experienced a great deal of distress and mortality primarily because the city's rampant, vigorous, uncontrolled development encouraged social Darwinism and extreme divergence of income and the quality of life.... "The ascendancy of death from the 1890s during the First World War illustrated not a simple instance of imperial exploitation but the flawed, disruptive quantities of modernization and development". (Ira Klein "Urban Development and Death : Bombay City, 1870-1914", 1986). Hygienic water supply and comprehensive sewerage was required and it was also felt that there should be decongestion of the crowded areas. (c. Furedy, "Bustee Policy in Calcutta". Also Govt. of India, Foreign Department, 1898).

The urgency in India was because at this time politics in India was acquiring a national and populist character, reminiscent of the Hungry Forties and Chartism in Britain. Official policy had to walk a delicate tightrope between intervention in the name of the public health and callousness in the name of *laissez faire.* In the 1890s in Britain and the United States of America housing, town layout and public health were becoming linked as public polity issues. Likewise at the same time in India—but on a scale almost Lilliputian because of scarce resources.

2. 1900-20 :

From the beginning of the 20th century, the tendency towards (i) greater population in the bigger towns and (ii) metropolisation of the cities becomes obvious. The older regulatory method of opening up a new *wada* was not used, and increasingly the settlement was in the interstices and on the periphery. This hightened the bottlenecks by closing up existing open spaces (refer to the 'Table of Open Spaces in Calcutta' in Richards' report) and by making future carving out of communication lines out of the town difficult. The most glaring example of this was the absence of links between Howrah and Sealdah at a time when the jute trade was reaching a peak. There were three known

alternatives in town expansion—zonal (as in Vienna), radial (as in Paris); and the grid-iron (as in the U.S.A.), all of which were becoming impossible in India because of the federative nature of the towns and because of the restricted finances which made land acquisition on a systematic basis difficult.

Town-planning in Europe has, as we have seen, meant one of two things. (1) corrective measures in sections of big towns; (2) planning a small town *in toto*. From the end of the 19th century the first is in evidence, in some British Indian towns. From 1911, the second is seen in New Delhi and Jamshedpur and Patna.

The Indian leaders did not fret about the contrast between orderly planned areas in cities and the so-called "formless" Indian areas. For that matter, there was no Dickensian anger seen in the writings of R.C. Dutt; there are no Indian "Muckrakers". There is no research on this very important point; Perhaps the explanation is that Indian expectations were less than that of the American reformers. "Congestion itself.... may have been considered a problem more by the British in India than by the residents themselves" (D.E. Goodfriend, 1979). The increasing racial distance made the average British official at the turn of the century unconcerned about the "Indian town". The few who were concerned were very articulate but they were constrained by very limited finances which made it impossible to regulate or even to monitor the growth of the towns.

There is a remarkable continuity in this century in the division between local authority as being required to provide urban services and statutory bodies being appointed to carry out specific developmental activities. Towns by the 1870s were already broken up into different jurisdictions—municipalities, cantonments, railways, Notified areas. As Richards commented in 1914 about Calcutta: "All schemes depend on the co-operation of every great authority in the city of Calcutta and its suburbs. The backward cities can be rectified and developed by (1) autocratic one-man rule; (2) a single constituted body of men; (3) full civic co-operation between all authorities and interested bodies. Calcutta has not decided which of these three to choose. They need co-operation of the Corporation, the Port Trust, railway companies, the tramway company, the merchants, the press and the public" (p. 167). To tack on Improvement Trusts was a confession of inadequacy and merely adding on yet another local authority. This was why Richards so strongly pleaded for comprehensive town planning legislation instead of piecemeal area development under the Trust. The Improvement Trusts in India (the first was in Bombay in 1898) were created not under any town planning committee but under the local Housing Act. They were not concerned with the existing city but to develop new areas. They were not concerned with the poor as such but with creating more sanitary areas. (Helen Meller). After the Town Planning Act was passed in Britain in 1910, Bombay Presidency acquired a Town Planning Act of its own in 1915, and Madras in 1920. These were pieces of enabling legislation by which town plans could be prepared for the various towns in each of these presidencies. (L. Bogle, H.V. Lanchester, *Town Planning in Madras*). Richards' survey of Calcutta remained the most significant survey such as was not done for either Bombay or for Madras. In his indictment, he called for an end to Calcutta's "50 years of neglect" and suggested agitating for more funds, giving the example of Chicago which had saved itself from urban disaster by timely action. He pointed to the need to develop a bold urban-suburban-extra suburban plan. He dratfed the Town Planning Act for "metropolitan" Calcutta (This was a word first used in the United States in 1910 for an urban unit other than that any within the corporate boundaries of a city). It is unfortunate that Richards' report was regarded as too ambitious, particularly since it came at a time when because of the First World War economies were being strictly imposed in an area which already was suffering from lack of funds. The report remains a remarkable testimony to the work of a man who in the span of a few months was able to survey and document all the urban problems of Calcutta. Town Planning Acts were passed in other provinces, and Kanpur, Lucknow and Allahabad acquired Improvement Trusts in 1919-20. A similar Act was passed for the Punjab in 1922. How far these were going to be effective would be seen in the subsequent years.

When Sidney and Beatrice Webb visited India in 1912, they described towns in the princely states as more homogeneous and pleasant than the towns of British India. These towns were smaller and except for Ahmedabad, had not been significantly affected by the massive population increase at the turn of the century. It is interesting that the cult of "Improvtment Trusts" caught on among the Indian rulers almost immediately. In their capitals holistic town planning was more feasible than in British India because of (a) the ruler's charisma (Koenigsberger, interview); (b) the lack of multiple authorities. Mysore acquired a Trust in 1903, in Hyderabad the great flood of 1908, like the great fire of London in 1664, led to rehabilitation, re-development and housing. The Nizam's Firman extended the scope of town planning to miles beyond the existing city. It covered aspects of town planning like roads, the river embankments, and monumental buildings. (R. Prasad, *The Asif Jahs of Hyderabad*). In 1914 the City Improvement Board was set up and in 1921 a drainage scheme was worked out. The town planners in Hyderabad were very active in 1934-44. (B.S. Townroe, "Town Planning—An Indian Example, Hyderabad", 1934). Another example was the little

town of Kolhapur which, in 1921, set up a City Development Ministry, and developed grid-iron suburbs in Shahupuri and Rajarampuri; J.P. Naik was the minister-incharge of Civic Development between 1944-54. It was commended that the orders of the Maharaja led people to surrender their house property willingly for town improvements. Jaipur by its Municipal Act of 1943 gave special powers to the government to regulate over-crowded areas. Travancore acquired a Town and Country Planning Act, (Note the inclusion of "Country" which was not done for any of the other provinces or states) in 1933.

3. 1920-1939 :

The 1920s and 30s were important decades, despite being the dark decades between the Wars, and the period when the Indian nationalist movement was at its peak. They were important for political initiative on many aspects of town planning, and for Indian princes and individual's responses. The most seminal thinking and writing on Indian urbanism were done at this time.

The period when Improvement Trusts were being set up in India coincided with the visit of Patrick Geddes, in response to the invitation from the Governor of Madras. India is particularly privileged in that this gifted man spent so much of his energy here and it is sadly significant that independent India has shown no recognition of this. The report or the T.C.P.O. (*Town and Country Planning in India,* 1962) does refer to Geddes briefly but there does not seem to be any lessons learnt from his suggestions. (By contrast, Pakistan has reproduced his report on Lahore in the context of planning for that city in 1965). Geddes in short visits to different towns produced incisive, if impressionistic reports far less detailed than that of Richards but with a remarkably intuitive understanding of the specific problems of each city. What is most important about him is that he is the first non-Indian to have appreciated the "order and the disorder" in Indian cities, recognized the rationale of building patterns in various cities and seen the need to every town planning to act as a corrective rather than to destroy the old and substitute new and expensive and alien planning for it. (Gillion for Ahmedabad, Stalley, for Lahore, Helen Meller for other British Indian towns). The princely states were remarkably receptive to Geddes. His reports covered a large number of these towns and his work for the Indore Durbar was a very detailed study which took into account the existing city, the proposed new university campus, new suburbs, and adjacent industrial township. This two-columes study is worth scrutiny because it has implications beyond the immediate context of Indore City. Geddes' lieutenant H.V. Lancster continued his work in Madras, and also was consulted by princes in replanning city centres and place complexes. As early as 1915, Geddes had commended his work "to the feudal princes of India. Lanchester had given a fresh constructive impulse, expressed with wise conservatism, respect for Indian architecture, craftsmanship and way of life". It must be remembered that Geddes and Lanchester were keen and making their suggestions before the discovery of Mohenjodaro in 1921 which was to revolutionalise the knowledge about earlier Indian town planning. Some of the impatient officials whom they criticised got their own back by accusing Geddes of vague idealism, lack of familiarity with local conditions" (Gillian, p. 150) but for the Indian Geddes did a signal service in boosting their morale in *swadeshi* urbanism and taught them to look into and appreciate it instead of being in a hurry to manchesterise their town. In his report in Indore (vol. 2, pp. 183-5 and p. 163) he urged the need for the municipality to be given town planning powers, and the importance of citizenship as a formative factor in designing towns.

At least five Indian scholars (Acharya, Ayyar, Bogle Chatterjee, Dutt), published works in the 1920s and 1930s which gratefully acknowledged their debts to Geddes. Venkata Ayyar published his book on *Town Planning in the Deccan* (by which he meant the far south of India) where he used epigraphic and literary material to show how detailed and sophisticated the concepts of building towns in India had been, and how these had taken into account local geography and climatic conditions. P.K. Acharya published a free translation of the Shilpa Shastra (the first English translation of these had been prepared in 1834 by Ram Raz but at that time his work has had little impact). B.B. Dutt also published *Town Planning in Ancient India* which for him was a voyage of discovery in the course of which he discovered a wealth of material pertaining to the subject in various treatises from early times. Linton Bogle, a civil engineer, in his small book *Town Planning in India* did the valuable service of linking traditional concepts of town planning in India to modern needs and did not foresee any clash between tradition and modernity as likely to happen. Sris chatterjee, an architect, who had a brief period of training in the United States of America, was to strongly advocate in the 1940s the need to integrate older Indian concepts with modern town planning. He looked forward to the setting up of a school for architecture in India which would be geared to India's needs and not a replica of British or American one. All these individuals and many other town planners and engineers had gratefully acknowledged their debt to Geddes. And most of their published work carry forewords by the master. Their work like that of Geddes' 40 odd reports on Indian towns were doomed to be neglected and forgotten and the movement that they had all looked forward to never took shape. Geddes

in 1915 had perhaps anticipated this when he wrote "Australia and South Africa seem about to launch on a new spurt of activity in housing and town planning. But in India it is largely different. New Delhi can but be a greater Canberra".

Before Geddes' visit the first wholly planned British town, New Delhi had been decided upon in principle, the architects selected and plans begun for its layout. Between 1914-31. New Delhi was built with frequent deadlocks over the siting of specific monumental buildings and with frequent cut-backs because of the imperative need for economy during the First World War. In 1911 also was begun the building of Jamshedpur. The Tatas employed John Temple as the architect for planning Jamshedpur and in reply to criticism of inadequacies in the town in 1920s it was pointed out that Jamshedpur was a much comprehensively planned town than any other industrial area in India, and had taken into account the different needs of institutions, factories, housing for managerial staff and housing for the industrial workers. It would be interesting to compare the architectural character of housing in New Delhi with that of Jamshedpur and both these it will be quite obvious, were going to be models, for the foreseeable future for building, respectively, capital towns and industrial towns. (Govt. of India, Industries (Labour) files, quotation from Valentine Chirol, T.C.P.O. *Report,* N. Datta).

Both New Delhi and Jamshedpur had, as it were, invisible walls for in neither case was there any incentive for surrounding villagers to go to these towns. They, therefore, remained fairly static in their population, (the story of the expansion of Delhi after 1947 is explained by unforeseen circumstances). Today the city of Bhubaneswar presents a similar picture. Jamshedpur could be contrasted to Naya Indore. the project of Geddes, by which an industrial city was planned but in proximity to an existing historic one from which it dress much cultural sustenance.

The lucky accident of having Geddes in India stimulated some Indians to respond with their own ideas in the form of books and articles and many to draw inspiration of his vision in actual town planning activity. The 1920s and 1930s was a time when a "town planning movement" seemed about to begin, as Geddes had predicted in 1915. That this coincided with the years when local self-government became a 'Transferred Subject' under the system of dyarchy should have meant a happy marriage, but unfortunately this did not occur, partly because the 'transferred' departments did not get much by way of funds. It is instructive and it is disconcerting that in terms of administrative reform, the 1920s and 1930s are a stagnant period. Of course for the 1930s the blame can be put at the door of the Depression which meant severe cut-bracks in spending.

In these decades, the proliferation of railway lines led to increased movement of traffic and this was particularly seen in the increased congestion in pilgrim towns like Hardwar and Benaras. In district and provincial towns like Allahabad, Lucknow and Kanpur, the contrast between the open and green civil lines and the crowded cities with their first disappearing open spaces was becoming more marked. (Linton Bogle, and S.R. Davdge). Lahore was an interesting example of a British town which developed garden suburb (quite different from the concept of New Delhi which has been misleadingly called the Garden City). Lahore's Model Town was a residential suburb of which two-thirds was open garden spaces. What should have been done at this time was to creat town planning controls for growing towns in order to regulate their physical expansion. The only example of this (apart from the much earlier one of Hyderabad given above) was the creation in 1946 of a Town Planning and Siting Committee for Delhi to Control the area around the city. Ironically, this Committee's functioning was going to be overtaken by events and subsequent town planning in Delhi was going to be remedial as much as regulatory. From the late 1920s there was some new towns which grew into large ones. Apart from Jamshedpur there was the industrial town of Durgapur and their was the growth of health resorts like Ranchi and Puri, the Indian equivalent of European hill stations which had been growing over the last hundred years. In these and in extensions to older towns like Patna, there was an element of planning all carried out by foreign architects since Indian architects and town planners did not exist. In all these the grid was taken as the necessary norm.

The Indian Industrial Commission in 1916-18 had referred to cities as "possible centres for modernizing Indian Society". This Commission had pointed to the imperative need for providing subsidised housing for the industrial workers. Their suggestions were to be taken up only eight years later in 1926 when the provincial governments were asked for their views on the question of providing subsidised housing. It is important to note that many Indians consulted were reluctant to spend municipal funds on such housing and most factory owners preferred to provide sites for the workers to build their own homes rather than to pay for planned housing provided for them by an external trust. On the whole lack of interest shown in town planning and necessary for sanitary reasons is again reflected in the lack of concern for housing for the poor. J.W. Bhore felt that this was dangerous complacency.

I deprecate large or radical change, but feel that unless we make a beginning, we shall delay progress in labour matters till serious

danger overtakes us. (Govt. of India, Industries & Labour files). The Depression put paid to all plans for housing and the sum total of achievement in this respect in the 1930s and 1940s was very minute.

Another issue connected with the broader questions of town planning was that of architecture. This had become a political issue at the time of the building of New Delhi. Here the agencies like the India Society had worked hard to create an interest among Indians and Europeans in Indian styles of architecture in order to retain these for future Indian town building which would otherwise be swamped by alien European styles. The 1920s saw considerable building activity in the princely capitals and a proliferation and Indo-Saracenic architectural styles. One of the factors retarding the growth of Indian architecture was the very limited opportunities available to Indians to formally study either Indian or European architecture. Not till 1929 did Indians win their right to have a degree in Bombay recognised by the RIBA (Royal Institute of Building Architects). By this time the introduction of reinforced concrete to India as an element in building portended the likelihood of Indian buildings of the future going the high-rise way of western Europe and America. This would mean economies of scale but how an alien style of architecture could be harmoniously integrated into Indian towns and to British colonial Indian towns was going to be questionable. It also meant that the divide between engineers and architects was going to widen again soon after it had narrowed. The larger question which was going to be posed was that of traditional architectural styles and housing patterns as opposed to western models in a situation where Indian towns had been allowed to grow horizontally, and most importantly, without modern or modernizable communication networks.

The period from 1905-30s was when the Indian nationalist movement was gathering strength and creating an ideology for itself. A part of this was a lack of interest in industrialisation and urbanization. In fact the rustic was glorified in contrast to the urban by the Indian Ruskins (R. Tagore, "City and Village" lectures give in 1928 in anthology *Towards Universal Man*, Bombay 1961, quoted in Hugh Rinker, *Reorientations* OUP, 1965; Gandhiji in *Hind Swarai*, 1919, and later interpreted by Jayaprakash Narayan in *Plea for Reconstruction of Indian Polity* (1959). Jawaharlal Nehru on this subject of urban poor as on many other issues spoke with feeling but no precise plans. In the 1920s-30s when a large number of very distinguished nationalist leaders were at the help of municipal affairs in Indian towns, it is remarkable that they were more concerned with nationalist politics than with local improvements. The Congress Planning Forum in the 1930s and 1940s did take up the question of housing and of architecture for detailed study (see Chapter Seven below). When the Public Health Commissioner of the Government of India prepared his annual export in 1940 he commented that "while town planning and some slum clearance had been carried out in some of the larger towns by Improvement Trusts, the beneficial effects of these have been offset by the indiscriminate construction of insanitary buildings on cleared areas through the failure of local bodies to exercise powers, under building bye-laws, to regulate house construction. The Board recommends the need to strictly enforce the building bye-laws" (Annual Report of Public Health Commissioner, Government of India, 1940).

4. 1940-1959 :

In the 1930s-40s the Depression and the Second World War made it difficult to carry through in sustained or large scale measures of town improvements. (TCPO Report). It is also implied that these were made abortive because of vested interests particularly because of the increasing value of real estate and in the 1940s the introduction of Rent Control legislation. The enormous overcrowding which took place in the 1940s, particularly in Bombay and Calcutta, were making it imperative to find safety valves for expansion in these cities. In 1947-48, the problem created by the refugee influx was bad in Delhi and extremely acute in Calcutta.

Immediately after the Second World War, in 1945-46, there was a remarkable sense of purpose and hope expressed by Indians and British officials, (who did not seem to have realised that the parting was going to come within a few months). (P. Griffiths, 1945; Bimal Ghosh, 1945).

The lack of self-confidence and the lack of funds on the part of the Indians led to the summoning of Ford Foundation experts to assist in the process of town planning and town expansion for Calcutta. This was a continuation of the tendency from 1945 to enlist the help of foreign experts in areas connected with the urban and rural planning in India. The faith of the Congress Party in Soviet-type planning and in west European and American expertise led to the mushrooming of towns planning boards and laws based on western European and American models (N.V. Modak, V. N. Ambedkar and A. Mayer, 1948; also *Report of Nagpur Improvement Trust Enquiry Committee*, 1947; and *Report of Environmental Hygiene Committee*, 1949). These, it should be remembered, were being superimposed on a constitutional framework planned in 1919, modified in 1935, and elaborated but not essentially changed by the Constitution of 1950. The long term result of this was the introduction of concepts which were strictly specific to West Europe and American but were being treated as universal norms. "Urban planning in India relies heavily on the concepts and techniques of

planning evolved in the 19th and 20th centuries in North America and West Europe, notably the USA and Britain. There is an attempt to transplant rather than to transform western standards to suit Indian conditions. Functional standards emerge as a result of the codified aspiration of an interest group in response to situations in which resources are to be distributed. Professional standards are not adequate criteria for investment planning for urban development. (Ved Prakash, pp. 74-5). The gap was identified by the simple subtraction of the situation in the underdeveloped country from that in the developed countries. It was sought to be bridged by methods which could be expensive as well as not necessarily congenial to the Indian situation. The total faith in town planning as a cure for all ills in mirrored in the report of the TCPO which speaks of "a wave of systematic planning" (p. 40)—between 1960-75 as many as 400 master plans for towns cities and city regions in India were formulated (IIPA, City Development Plans and their Implementation). Nobody remembered the wisdom of Linton Bogle, who had reminded us that "India is not one country" (p. 54) Koenigsberger, the town planner for Bhubaneswar, very recently admitted that he and his generation had been completely wrong in their assumptions and they had committed some irretrievable blunders in good faith while planning for India. (Alan Turner (ed) *The Cities of the Poor* 1980; See also M.J. Abedia *Our Cities and Towns,* Dacca, 1970).

While making this criticism it should also be appreciated that the size of the task under taken was gigantic. Earlier urbanization policies like that of setting up chain of forts of *mandi* towns and *gasbas,* or of building railway towns and cantonments were very small compared to the ambitious plans from the late 1950s for regulating existing towns as well as for building the mandi towns and administrative towns and refugee settlement towns. (J.P. Leuis *Quiet Crisis in India,* p. 100 ff for market towns in India 1930+). Others involved in the decision-making were later to criticise themselves for their own bad choice of towns (P.C. Alexander quoted in S.S. Shafi in Ved Prakash). The priorities also swung violently from one end to the other and the assessment of the Third Five Year Plan was that "In plans hitherto formulated urban areas have not been actively associated".

5. 1960-1987 :

In the 1960s there was concern to develop "medium" towns and to create new towns where necessary (R.K. Vishwakarma and G. Jha 1983). Form the late 1970s there started a growing suspicion that solutions on paper might be perfect but the means and the will to implement there were not. In the 1980s there has been further rethinking, but still not the understanding that despite railways and the economic and political unification of the country, regional variations and contextalism are still vitally important. A critique of the Chicago School was published under the caption "If All the World Were Philadelphia". Similarly, it would be useful to remind our planners that all of India is not Delhi (cf Model Town and Country Planning Act, 1973). (2) Urban renewal—of G.S. Duggar in *XVII International Congress of Local Authorities,* 1965).

CHAPTER 7

PUBLIC SPACE IN TOWNS

THE DISCOURSE

Buildings have to be seen in relation to the total urban form. While monumental architecture in India has been extensively studied over the last 200 years, public space and urban design have been studied only partially and very recently.

The study of Indian architecture like that of Indian history, suffers from having been treated in a religious—chronological framework which ignores the continuities. This tradition, begun by James Fergusson, is still very pervasive. (Contrast Western architectural history, where the categories are more related to time and place).

For the architecture of the British period, the terms 'colonial', 'P.W.D.' and 'Indo-Saracenic' are used. When writing about post-Independence architecture by Indian practitioners, 'modern' is used. Some European architects in India get more attention than others. Corbusier has been repeatedly studied. Koenigsberger has not. This is also true of Indian architects. It is striking that, considering the vast amount of building that has occurred in India over the last 50 years, so little has been written, other than articles in a handful of professional journals. The student of architecture has no textbook on modern Indian architecture to use as basic reading.

A. The Architect/Builder

The Indian builder (Sthapati) was one of a group of craftsmen, along with the mason, the woodcraftsmen, the ironsmith, the jeweller. From early texts we see that he was supposed to be divinely inspired, to be constructing in the image of heaven. Astronomy, devotion, a sense of ecology, an unselfconscious contextualism, played vital roles in his work. The absence of archaeological remains of towns over long periods should not be held to mean the absence of building. The Indian builder was constantly experimenting and innovating, both in material and style. The influence of Hellenistic styles, the introduction of the true arch and massive dome with the Turkish settlement, the use of iron (making it possible to build huge halls) and later of cement and reinforced concrete during the 19th century, all indicate modifications and adaptations by the Indian builder and craftsman. An important change was when in the 19th century buildings were constructed according to paperplans (often prepared in England), thus limiting the independence of the builder. The alienation became more marked as the architect's profession became distinct from the builder's and architectural 'training' came to be on European and American lines. Only in the last few years (from 1982) has there been an acknowledgement that indigenous methods of building have much to recommend them, and that vernacular architecture is ecologically good sense.

B. Categories

Public space can be classified under the following heads :

(i) **Official :** Work-place and ceremonial residences for rulers/elected representatives/Civil servants.

(ii) Main temple/mosque/church and space around it.

(iii) Piazzas/bazaars—public gathering areas, markets

(iv) Streets and avenues

(v) tanks, wells, canals

(vi) Parks, orchards.

C. Analysis

Public space is very much used in a climate like India's. In analysing public space, in terms of layout and architecture, the following questions should always be kept in mind :

(1) How it grew/was planned/modified

(2) Whether it was intended to integrate/separate governers

(3) What the private contribution(s) were to building.

(1) **Official :** (a) royal or gubernatorial houses at Mohenjodaro, Pataliputra, Vijaynagar, Shahjahanabad, Jaipur, Fort William, Simla, Mysore, New Delhi, Chandigarh Area, buildings, number and category of inhabitants where known. In the *Arthasastra,* "the palace, the court, the city the country, and the states surrounding its frontiers are seen as successive zones around the person of the kind—in part protective, in part theatres of royal action. In sisupalgarh, in Orissa, excavations have revealed a fortified city of the 1st century A.D., with an 8 ward internal division made by roads running from 2 gates in each wall of the square site—thus allowing a central ward, 1/9 of the total area to be occupied by the pillared palace (Kirk)—The same principles can be seen to have operated in towns in South India and Ceylon. Another feature described in the *Arthsastra* is seen in Ceylon,

in the twin cities of Anuradhapura and Ponoana—Euva. The latter is described as the 'Camp City' which suggests that it was used as a royal residence when Anuradhapura was deemed not to be safe. (The King) may employ outcaste men to build at the extreme boundary of the Kingdom of palatial mansion to hold substantial treasures against dangers and calamities (S. Paranivitana).

The Shilpa Sastras suggest many permutations in the arrangement of public space and areas allocated to groups of citizens. The palace can be at the centre of a circular or in a quarter of a square arrangement. In the case of Jaipur, the most recent example of classical planning, the palace area occupied the central square in a rectangular arrangement. Earlier examples are of Mohenjodaro, where the palace is in the centre, though the alignment is not very symmetrical, and of Sisupalgarh. In towns like Shahjahanabad and Lucknow, the palace is at a side, and in towns like Agra and Shahjahanbad, it is fortified independently of the town. When the British built governors' houses, and the Governor General's house in 1803, these were estates in dependence of and unrelated to the existing town. The equivalent of the chowk was the Mall.

(b) office-buildings at Calcutta, Allahabad, New Delhi, Chandigarh, Bhubaneshwar. Official buildings as separate from Governor's or ruler's residences began to appear with colonial rule, the classic example being Calcutta's Writers' Buildings. These were extended to provincial capitals like Allahabad and Lahore, where the British administration was lacked on to older towns. Here the best example in terms of monumental architecture is Bombay, where in the 1860s an extravagant building-spree was launched, to make the city "urbs primis in Ind". Later examples were Baker's Secretariat buildings in New Delhi, Corbusier's in Chandigarh and Koenigsberger's in Bhubaneshwar. In the 'princely states', when after 1947 it became necessary to conform, similar extensive offices had to be found, and in most cases these have been housed in old palaces.

(c) Military headquarters/Forts at Gwalior, Vellore, Agra, Peshawar etc. Apart from city and palace walls, most regimes had fortifications *per se*, particularly on frontiers, Tughlakabad, Gwalior and the Maratha forts are examples of fortified settlements, with adjacent urban areas [the term for this in Tamil is *Peettakottai* (town-fort)]. In terms of material and workmanship these forts are some of the best specimens in the world. The British system of defence was to have a large open area called the cantonment (a modified use of a French word), different from 'civil lines' only in that the occupants were military personnel. After 1857, the British took over many Indian forts as well in preference to the earlier policy of demolishing them. Military space is for most part *restricted* public space, with sections out of bounds to the public. Cantonments today appear as a great waste of urban space, but can also be viewed as green lungs in crowded towns.

(2) **Shrines and Universities:** The founding of a temple was usually an integral part of laying out a town. Madurai and Shringam are classic examples of towns structured around temples. This also applies to Mosques. In Lahore, Fatehpur Sikri and Shahjahanabad, the mosques were built at the same time as the palace-complex. Shrines attract regular worshippers as well as pilgrims. The shrine becomes multifunctional, generating services linked to the pilgrim clientele. "Commerce and Religion are sister arts in India" as a British official noticed. This is why certain towns like Mathura, Varanasi, Kanchipuram, and Puri are above all temple-towns, where trade and production is geared to the pilgrim traffic. Elsewhere, the annual festivals are shrines generate a traffic which places a great strain on urban services. As landowner, the shrine has a significant part in the settlement pattern of the town. In many towns, most of all in the Tamil Country, much land belongs to the temple; *Waqf* properties in Islamic settlement also create a similar situation. The official control over land use here is very limited. The endowing of temples was a traditional form of investing wealth; in the 19th century this was supplemented by the endowment of educational and charitable institutions, particularly since government investment in these was very limited.

Temples usually have provision to accommodate large numbers within and without, and command a grand circumambulatory route for the *Rath* procession, even though this may occur only once a year. The ritual of the temple dance gave them a quality of life absent in those same temples today. The location of the mosque is dictated by the need to be within walking distance for all the town dwellers, and the Idgah by the enforced location beyond the city. These features have an obvious bearing on the morphology of the town. Many towns have both a major mosque and a temple in them, and there are known instances of the same pilgrims patronising both. An instance to show how religious places can change landscape, and create traffic and land use problems is the building of temples in the Lodi Road institutional complex in New Delhi.

Educational institutions were often linked to shrines or cult-centres. These (Nalanda, Varanasi, Feringi Mahal in Lucknow) need to be compared with more recent secular universities and technical institutions. The criteria for locating schools (patshalas madarsas, modern schools) should be examined. Earlier educational institutions catered for a resident student body, today for the neighbourhood. Educa-

tion, like shrines, are business enterprises today, and land use in their case too has became politicised and subject to pressures.

(3) Museums and auditoria, a British innovation, to be contrasted to the salon culture of older traditions.

It has to be examined how far they have succeeded as a means of public education, and whether their locations have helped/hindered their accessibility.

(4) Avenues in Delhi, Jaipur, Madurai, Calcutta, Bangalore, New Delhi, Bhubaneswar to be compared, as well as their uses—pedestrial/vehicular/bazaar/periodic fairs. Modern 'shopping complexes' should be compared to older arcaded bazaars, and the relative location of dwellings and shops studied. Window shopping and strolling is such a major leisure activity in India that town planners have to pay attention to it, and comparisons with earlier towns would help.

(5) Water is crucial in towns in India, for its useful as well as aesthetic qualities. *Baolis* (with temples and schools attached) are common in north India, canals in some towns, tanks and fountains in many temple-tanks and storage tanks are common in Rajasthan and in south Indian towns, and tanks formed part of the landscape of historic Calcutta.

Many cities are located on or near rivers, Varanasi and Allahabad being only some of the most important of the towns that owe their sanctity to this fact. The changing courses of rivers makes for instability in townsities.

(6) Trees and gardens likewise are a vital part of city landscapes—gardens of fragant flowers in Madurai, woods in Pataliputra, orchards near Shahjahanabad, and in the Dariya Daulat in Bangalore. In colonial cities, parks and botanical gardens were cultivated in the 'British' areas. Parks also were used to act as *"cordons sanitaires"* to separate British and Indian areas.

The major point that emerges is the contrast between the indigenous sense of the informality of public space and the formality of private areas, even in areas controlled by political, religious or military authorities, by contrast to the British private informality and public formality. Today towns are in danger of combining elements of both in a fashion that will generate either chaos or dreariness.

CHAPTER 8

PRIVATE SPACE IN TOWNS

"A city is a place where artisans dwell"

ABDUL FAIZI.

THE DISCOURSE

Between *kacha* and *pukka* houses, between houses in a 'colony' and those in a shanty-settlement there lies a vast social gulf. The pecking order is also decided by location and size of plot, both in official and private housing.

Snobbery is inherent in any discussion on housing, but this is often tempered by a social conscience. It is an unfortunate fact that in India it has not been so tempered. An examination of housing makes clear (1) the wide disparities in the range of housing at any time in India, and (2) the long crisis of a shortfall in urban housing over the last 100 years. There has been no sustained sense of the urgent need to ameliorate this, and after a brief period of improvement (1919-39) the crisis has been accelerating. Urban land is increasingly becoming a commodity, and a legal share in it difficult to procure. This make the struggle even more grim.

HISTORY

1. Private space in Indian towns is something on which we have relatively little written information for the centuries till the mid-nineteenth (this can be contrasted to the excellent archival information available for European towns and, nearer home, for towns of the Turkish Empire in the 17th century). There are references to urban land/houses in India being inherited, in the early historic period, but this is too fragmentary to be of much use. Plots of land were allocated to individuals, charitable organizations or guiles, in and near towns, with evidence of generosity at the time a particular town was being built. Categories of houses, in descending order according to the material used (stone, brick, mud) are a commonplace in the writings of many travellers. There is (from Megasthenes through to Tod) admiration for the quality of architecture and the life style of the affluent, and equally copious references to the makeshift homes of the poor (of Bernier's graphic description of Delhi as a cluster of villages, because of its thatched roofs). It seems quite definite that there was no hierarchy in the housing pattern, and even that the belief that the chief officials lived around the Palace was not true. The settlement pattern was not concentric. Many high officials preferred to live outside the walled city, by the river or ensconced in gardens. House patterns vary from one region to another (see descriptions of Jaipur drawings in Spate and Learmonth, in Iyer Vol. 3, in Batley, Petruccioli and in Hirt) as do size. Orientation, the location of the garden, and the relation to other structures vary with climate.

2. The major variation in housing patterns was the introduction of 'Colonial' housing, which has a superficial parallel to the garden-houses of Kerala, but to nothing else in India (A.D. King, 1984). This was *sui generis* bearing no resemblance to any urban from in Europe or India, and explained by the obsessive need to : (a) maintain distance from the Indian areas, (b) maintain distinctions as between different categories of officials, (c) have self-contained houses where all the attendants would be housed in 'quarters' in the way they were in the houses of the wealthy in Indian towns. This rigidly gridiron pattern lacked the social harmony created by narrow lanes and cul-de-sacs, apart from being enormously wasteful of resources. By locating officialdom in a segregated ghetto (contrast the closer physical link between rulers and subjects in older towns) it made them uninvolved in the bigger urban settlement, and therefore, new migrants to the city were able to encroach on public land unchecked. The growing towns of 19th century, England were controlled by effective municipal government. In India also the 19th century saw increasing urban population and therefore settlement in towns, but with no controls. The absence of a property tax in British India made for a fuzziness in urban land records which is in marked contrast to the precision regarding property rights of the rural areas.

3. By the end of the 19th century, them, certain features of Indian housing were apparent, which were to persist through the 20th—the absence of precise property-rights registers ; the absence of building controls in the older towns and in areas adjacent to colonial towns (misleadingly called 'suburban') ; rigid controls in the areas of civil and military lines ; varied housing patterns in the old towns by contrast to hierarchical rowhouses in the 'colonial' areas. Two factors in the late 19th century were going to create a new consciousness of the need for 'housing'— (a) railway building and industrialisation in the metropolitan towns leading to an inflex of labourers ; (b) the outbreak of plague in the 1890s.

4. Housing becomes a felt need when the gap between population and accommodation increased, as has been happening in the last century initially in the metropolitan cities, and later in other

towns. Till the early 19th century, as we have seen (Chapter Five) it was possible to 'shift' towns, to establish new ones or add wards. The new features from the second half of the 19th century were :—

(a) With the British rule becoming firmly established, all over the sub-continent, and with it the rule of property, urban areas became permanent, the value of land in towns and near towns started to increase ;

(b) The unthinking policy of establishing factories in the near big towns attracted labour to these ; male labourers was also brought in for railway construction. In both cases, the same laissesfaire policy as had been seen in England till the passage of the Workmen's Housing Act, 1870, no wards were provided or workers (though earlier rulers had done so).

(c) This when coupled with the feeble powers of the municipal bodies, meant that housing was being provided or acquired in a quasi-leval fashion which made it difficult to modify or control it later.

(d) Even when the moral economy of the pre-factory age, which had implied that Karkana workers would be housed in the master's haveli gave way to the impersonal factory system poor transportation meant that workers still wished to live near their place of work, this led to densely-peopled autobuilt homes springing up near factories. The result was that, in addition to British area, and the Indian area, industrial suburbs could be recognised by the end of the 19th century.

(e) In the 3 Presidency towns the need of the workers was exploited by property-owners, who let out land or built multi-storey houses which were let out as tenements. The bastees of Calcutta, the chawls of Bombay, the cheris of Madras and the pols of Ahmedabad were each classic examples of this. The pressure on these led to them being seen as health-hazards by the 1890s, particularly then there occurred first in Bombay a plague epidemic, the first since the 17th century.

5. It was ironical that the British government, obsessed with chalking up evidence for 'moral and material progress', noticed with satisfaction that towns were 'growing' between the 1870s and 1890s, without sufficient concern about who were contributing to the growth and where. With the examples of their own industrial towns behind them, it is surprising and unfortunate that notice was taken too late and, when it was taken, without the means to act, either by attacking vested interests or by providing alternatives. This is not to belittle the excellent diagnoses of the problem that were made in the first three decades of the present century. But while individual Englishmen made excellent diagnoses, the 'system' (the financial constraints of the army budget and home charges) prevented any imaginative outlay on following up the suggested remedies.

"We are planning for India, not Utopia" said an I.C.S. official wryly, a propos of an Expert Committee's recommendations.

6. Before looking at the suggestions for 'improvements' of town planing and housing, the nature of the slums should be briefly surveyed.

(1) **Calcutta Bastees**—From the mid-1880s, in addition to the division in the city between the southern (European) and northern (Indian) sections, there developed a third area, the suburban, which was not included in the municipal area (Contrast the demarcation of *wadas earlier*). Bustees were seen initially as a health-hazard, because of their liability to epidemic and fire, these 'villages in town' could be improved only by providing drainage and clean water, which the corporation was unwilling to do, particularly since most of the bustees were private property—In the 1890s, when it was suggested that *pucca* houses be provided for the working-class (as in Britain) it was argued that these would be unsuitable for the villagers who migrated between Calcutta and the villages. With regard to improving the 'bustees' health, the emphasis shifted from filling in tanks to opening up roads through crowded *bastees.* The linked question of providing alternative houses for those displaced was sidetracked. Since opening out roads needed financial resources; the Calcutta Improvement Trust was proposed as a body, which could handle the problem (see C. Furedy 'Dilemmas of Calcutta's Bustee Policy in the 19th Century'). In 1929 Bogle was to write "The Calcutta Slums have another unenviable characteristic, namely, their great height. Many....chawls in the Burra Bazaar are 4 storeys high and some, as on Hamisa Road, are 5 or 6 storeys (this was because in India there was no regulation to limit height). The description of Calcutta's slums was capped by grimmer stories about Bangalore and Madras" (Bogle, 64).

(2) **Bombay Chawls**—Land being more valuable in Bombay, instead of open bastees, there were large blocks of buildings constructed for letting out as tenements. (N.B. The 1883 Gazetter for Poona stated that such chawls were being built there also to house the poor—M. Bapat). When Turner and Goldsmith wrote *Sanitation in India in* 1917, they dedicated the book to the Bombay Municipal Corporation and suggested that legislation on the lines of the Housing and Townplanning Act of England (1909 was necessary, to enable municipalities to acquire land and erect workingmen's houses on it with stringent regulations to control height and setbacks, and exterior and interior open spaces—It was suggested that medical officers be given considerable greater powers than their counterparts in Britain to inspect buildings.

(3) **Madras Cheris**—It is significant that the squatters' settlement in the city were described by the locals by the derogatom word used for the area lived in by the 'outcasts' in a village, though in the city the squatters were not necessarily men of lower castes, but usually from non-Tamil area (Bogle).

(4) **Kanpur**—developed as an industrial town, without housing being provided (contrast Jamshedpur below). (N.B. For Bombay, Madras, Delhi, Pune, Chandigarh and Ahmedabad, see A.R. Desai S. D. Pillai, 1970).

7. In the inter-War years, there was a great increase in the population and density of towns, and this led to important developments in ideas and in policy :

(a) the need to pinpoint responsibility for providing housing to the working-class ;

(b) the needs to decongest inner cities, by drastic methods or by 'conservative surgery' ;

(c) the need to devise or revive building techniques, emphasizing economy and context ;

(d) the need to see housing not just in terms of "accommodation units" but of the requirements for a healthy and happy existence.

8. (a) The *railways,* which had two periods of construction activity, in the 1860s-70s and again the 1890s-1900s, were able to render a considerable service by providing homes for their different categories of employees, since they appropriated land beyond their immediate needs, and at minimum cost.

(b) In Jamshedpur, built as a planned city from 1911, graded housing was provided—houses for European employees, 'quarters' for skilled workers, and plots and building material for unskilled workers. A survey in 1921 (G.O.I.-Labour) concluded that the last was the most successful feature since the 'quarters' were too close, built back-to-back and without verandah, whereas the Indians built comfortable and congenial living areas. In the 1920s jute-mill owners in Calcutta also provided houses for their employees.

(c) It was at this time too that New Delhi was being built, where accommodation was provided in rigidly graded fashion for categories of employees, with attached gardens for the superior officers and 'quarters' around a quadrangle for the junior employees.

9. Jameshedpur and New Delhi were uni-functional towns built in holistic fashion. The problem of providing housing and at the same time maintaining basic standards of health were acute in multifunctional towns. In the 1920s and 1930s, housing became a sub-category of 'Welfare of Labour' which was a 'provincial' subject under the Devolution rules of the 1919 Act. The Royal Commission of Industries (1916-18) had recommended that the central government have powers of compulsory acquisity on of land to provide workers' houses, because in many instances it (had) been brought to their notice that lane very suitable for the development of housing schemes had been held at ransom by the owners, fantastic values being put on it as a result of the construction of factories in the neighbourhood. The prolonged debate which was the sequal to the industrial Commission's recommendations indicated the central government's concern to take on powers to control housing, and the reluctance of factory owners and rentiers to permit this. Geddes warned that "if the question of industrial efficiency is seriously to be considered here, the housing of the workers cannot be left haphazard, to the present insanitary and increasingly overcrowded conditions" (Report on Lahore, in Stalley).

The Bombay Development Plan of 1920 provided mass-produced housing (625 chawls) for industrial workers—which Geddes called "Bolohevk Barracks—sunless, airless holes, fit breeding ground for discontent" (Housing Committee Report, p. 121). The message went home. In 1929, Radhakamal Mukerjee wrote that "it is now realised that a programme of amelioration of the workers' living conditions is far more important than improving the conditions of work and of industrial management" (Bogle, Preface).

10. At the same time as there was concern to provide housing for labour and to check the growth of *kacha* housing in the areas beyond older towns, there was also a belief in the rightness of Haussmann's measures, for cutting wide roads through crowded areas of the Indian town in order to have conduits of pure air. Much in this direction had been done before the voice of sanity was heard. Geddes appealed (1916) "that no man be evicted from his dwelling for any public purpose, until a new one has been found by him or for him; and this.... not less, but more suitable for the needs and purposes of his family". Geddes understood that the local authorities found it relatively easy to relocate or dislodge poorer sections. Bogle saw the Indian laws of inheritance, which led to the sub-division of plots and houses, as a cause of congestion. To Geeds, caste and family were factors for stability. "In Balrampur Geddes suggested that members of the Washermen caste who were being removed from a very congested mohulla could not be retituated in a newly-developed southern suburb....because it would be too remote for them to meet their traditional obligations to kin with whom their families had been related historically" (D.E. Goodfriend). There was a perceptiveness in this that later Indian planners could have learned from. In Patiala, Geddes suggested industrial location in a residential area in preference (based on the workers' preference) to suburban housing.

6—329 M of Urban Dev/ND/88

By contrast, Bogle (1929) believed that the solution lay in decongestion. "If the population, now over-crowded in the slums, were evenly distributed over the whole area, there would be plenty of room for everyone, and the poorer classes would be given the first essential of economic housing—cheap land" (p. 67). He added "The most hopeful outlook for better housing in the future lies in the establishment of village suburbs within the city.... labourers villages and community centres will provide them with the home life to which they are so attached" (Bogle, p. 72). Garden suburbs on the outskirts, with cooperative societies helping housebuilders, together with the repair of slum houses, was what he saw as practical policies.

Bogle, while stressing the need to link housing and town-planning ("In many countries—legislation regarding both is combined in a single Act"), emphasized that it was the housing of labourers that gave most cause for concern.

11. From the 1920s through the 1930s, many *kacha* houses were upgraded, and many tenements provided. In the 1920s, cooperative societies supplemented the work of municipalities and private agencies. At this time also, 'middle-class housing' started to appear as a feasible programme. To handle the possibilities here, books were written to advocate styles, material and location. Clude Batley, an English architect, working in Bombay, pleaded that the virtues of 'vernacular architecture' be recognised before adopting wholly European styles of building.

12. In an attempt to raise the level of public awareness on the need for healthier and more pleasant homes, Percival Griffths wrote a small book entitled *Better Towns* in 1945—"to help men from towns to plan a better life for themselves after the War". He highlighted the unsanitary and unaesthetic aspects of towns, which were not given sufficient attention, partly because of the strong anti-urban bias in India's leadership. "Whether we like it or not, we must accept the growth of towns as inevitable even desirable." He went on to highlight, among other things, the shortage of housing, and the need to provide this, in a total townplanning effort.

13. The realisation that towns has come to stay and were going to grow, is also seen in the *Report of the Sub-Committee on National Housing* under the Congress party's National Planning Committee. This sub-committee prepared its report in 1940, and updated it in 1946-47, taking into account the recommendations of the Bhore Committee, but before the suddenness of Partition and the transfers of population put new strains on housing. The sub-committee's report, unfortunately for many years has remained in cold storage. It is mixture of idealism and practical suggestions, of a kind that was not seen subsequently, as housing came under the purview of the Housing and Planning Boards which the sub-committee had recommended. The spirit of the 1940s is expressed in Bombay's Master Plan of 1948 (which was ignored in the Development Plan of 1939). "Housing does not merely mean constructing a building on a vacant piece of lane.... It stands for complete unit development with all the facilities such as local parks, recreation grounds.... schools, shopping centres....which are essential for good living and for fostering spirit and activity". (Modak and Ambedkar, 1971, p. 227).

14. From the 1950s, housing was taken on as a government responsibility, with subsides given to state governments and cooperative building societies (H.U. Bijlani, 1970). It was controlled by statisticians and townplanners trained in the USA or in Europe. The human quality seen in Richards, Simpson, Mirams, Geddes, Batley, Bogle and Bhore was lost. "Master Plans for the Third World....fail to give due weight to the growing significance of spontaneous settlement within the urban form or, where they do, tend to look forward to a millennium where all squater huts will be eliminated and replaced by regularly laid out housing in the image of the Western City". (D. J. Dwyer, 1975).

15. Ashok Mitra pointed out that "in the popular mind townplanning has come to be strangely associated with bhavans, showpieces, expensive place-glass.... The gulf between planner and the beneficiary widens, favouring the former's alliance with the source of power and money" (1968). Geddes had *lived* in old Edinburgh when preparing a city survey. Indian planners could not bring themselves to do this. They therefore, described inner cities as slums, and instead of seeking to upgrade old housing stock, chose to retain the Rent Control Acts imposed in the 1940s, without providing incentives to owners to upgrade their property. This would have been the economical supplement to the public housing launched by the 1st 5-Year Plan, which built houses too expensive for the poor. (The same is true of many other countries. For Mexico, see Angus Maddison, 1970). "In the symbolic low cost housing projects, the poorest very largely subsidise the not-so-poor" (Dwyer). Also, in planing new housing, the sensible was often sacrificed for the economical, Koenigsberger, who listed in India in the years of its transition from British India to Independence, urged builders to remember "the advantages of ground-floor accommodation", pointing out that it was the "need to think in terms of ground-floor structures and to provide for adjacent open-air living space for each family as the cheapest possible solution of the accommodation problem" that explained the low densities in projects in the 1950s for new towns, both 'refugee' towns and new capitals.

16. Simultaneously, the decades from the early 1950s saw an accelerated urbanization, due to various factors (see Chapter Three above). The

housing programmes could not hope to keep pace. The increased immigration meant that housing remained inadequate. The Bulsara report showed the single-room tenements housed 77% of Bombay's and 67% of Kanpur's population, with 30 sq.ft. of room space being the usual allotment per person. The evidence suggested that the bigger the city the worse the conditions (Johnson, 160-161). Also, the elementary point made by Griffiths in 1945 had to be always borne in mind—that town planning and housing were linked. Town extensions had to be controlled according to a well-considered plan which took into account wide streets, parks and other public amenities—not provided. It was housing the people would provide for themselves, and slums would develop. The Bombay Master Plan of 1948 understood this. "Housing does not merely mean constructing a building on a vacant piece of land.... It stands for complete unit development". (Modak & Ambedkar, p. 227). Thus began the laudable but nearly always unrealistic exercise of juggling with population projections, physical planning and building estimates. The result was the growth of shanty settlements in the interstices of the built area, and on the outskirts of the cities. The economy and the human qualities of these have been analysed tellingly (M. Bapat, G. Payne, T. K. Muzumdar). Shanty-towns a century ago and today are only marginally different. They have always suffered from the absence of basic facilities and officials lack of recognition. But in independent India, where the inhabitants constitute votebanks, they have a greater chance of being allowed to remain in the city. This is one of the reasons for the enormous influx of rural dwellers to the towns. Lack of vigilance has meant that even areas demarcated as open spaces have been occupied. "It is not they recognised or that the planners are totally unaware of the deficiencies of prevailing standards....but that the legislative base of urban planning on the one hand and urban landholding on the other, and the still powerful technical conservatism and isolationism of town planning have combined to make authorised new initiatives long in the making and severely limited in operation". (M. Bapat).

17. Over the last 3 decades, the investment in housing has decreased steadily. By the time of the 7th Plan (1985-90) it has come to be agreed that it is easier to provide sites and services rather than the complete house. A recent study of Madras has shown that here, too, not enough is known about the people who are being provided for and that they prefer a more expensive house to the option of a cheap site (Robben and Stuijvensberg, 1986). Richard Batley (1957) believed that "India needs the means of mobilising credit for private purchasers and house developers" but had warned that she should learn from Brazil and "beware of establishing a financial institution with the power to become a policy matter". In the last twelve years (1975-88) there has been a big resettlement drive in Delhi, which provide accommodation for a very large number of squatters, but at a distance from their place of work, in order to preserve the aesthetic purity of the city. The undesirability of such class-based approach to housing has now been realised, and the cholera epidemic in Delhi in 1988 served to highlight it.

18. There is also discussion on the material and style of building to be used, and a bias in favour of the indigenous and vernacular is becoming apparent. From 1987 articles on the utility of mud architecture have been appearing in journals, and Laurie Baker's ideas are being elevated from the cranky to the sensible. Geddes and Batley's wisdom is being recognized, but not a moment too soon. Sunand Prasad (1987) points out, every country except India has a recognized domestic architecture with many excellent examples. In India, such examples as remain are in imminent danger of demolition. He illustrates this tellingly with examples of *havelis* in Delhi, which are not thought desirable as a living style, and not worth investment architecturally.

CHAPTER 9

CONCLUSION

From 'City of Palaces' to 'City of Dreadful Night'—300 years of an Indian city

The development of a 'colonial' town can be seen at its classic best in the case of Calcutta. At the beginning of the 19th century, it was a city which appeared attractive. "The near approach to Calcutta amply compensates for past disappointment and he, whose eyes had been hitherto fatigued with gazing on uncultivated barren shores, is equally surprised and delighted at the luxuriancy of the scene as he approaches this famed city. Gardens tastefully laid out and houses more resembling the palaces of Princes than the abodes of private gentlemen, certainly contribute to give the stranger a most favourable idea of the metropolis of the British Empire in the East".

Thirty years later, in the novel The Timely Retreat : Or a Year in Bengal before the Mutinies, Calcutta is a 'magnificient city' with 'rows of dazzling white mansions and beautifully laid out squares'.

"This no doubt is a charming Anglo-Indian city with a very hectic social life. But what about the majority of the inhabitants, the Indians who mostly live in the northern 'black town'?"

S. MUKHERJEE.

"In the eighteenth century very little was provided for Calcutta's inhabitants by those set over them. There was no 'native' hospital until 1793 and even then the funds made available were only sufficient for fifty in-patients. Crime was very frequent : even in the 1780s the city was said to be virtually unpoliced. Its streets were frequently reported as being chocked with 'filth, dirt and rubbish'. Its drainage system was gravely deficient, leading to flooding during the rains. In the dry seasons Calcutta was liable to devastation by fire. Even in the white town there seems to have no systematic attempt to plan building and lay out streets. By 1800 some slight improvement was being claimed. The city had been divided into police districts with guard houses. Reported crime was said to be falling; in 1797 only ten murders were thought to have been committed. A corps of scanvengers with 85 carts was being employed to shift refuse. But the city's drainage system, the state of its roads and the freedom of movement which they permitted remained lamentable.

Eighteenth-century Calcutta was clearly administered in a way that was not only inefficient but which encouraged neither the participation of its inhabitants nor any sense of common identity. Even the white town had no formal representative institutions, although the Grand Juries after 1726 allowed some outlet for opinion. Various voluntary bodies did, however, develop among the Europeans for religious, charitable and scholarly purposes and to organise theatres and concerts. Nothing remotely comparable happened in the black town, although some of its prominent inhabitants had begun to cooperate with one another for purposes which will be discussed later. For the vast majority of its population eighteenth-century Calcutta must have been either a temporary abode or a place where most people's horizons were bounded by their kin, their caste or those of similar ethenic origin.

By 1800 Calcutta had not yet achieved any real integration of the separate identities which had congregated within its boundaries, yet the accumulation of so many people and so much trade in a single place in so short a space of time was still a very remarkable phenomenon.

The juxtaposition of rapid urban growth and an apparently unchanging country-side had led many commentators to portray Calcutta's role in very dramatic terms. It is not difficult to see it as the obvious 'primate' city, a great parasite sucking in resources to be syphoned abroad or to be squandered by a narrow elite, while waves of immigrants are condemned to degradation and early death in its slums. Moreover, was not Calcutta the Trojan horse which brought foreign rule and alien cultural domination to India? On the other hand, the kind of case that has been made for eighteenth century London as an engine of growth could also be made for Calcutta. Its great volume of exports and the consumption by its inhabitants no doubt stimulated production over a wide area. The change of moving to the new city gave men an opportunity of breaking out of the constraints of a closed society. Finally, Calcutta has been seen by many not as a source of cultural contamination but of regeneration as the home of the Bengal Renaissance in the early nineteenth century".

P. MARSHALL.

In the 19th century, the combination of a swelling population and an ad-hocism in policies of providing essential services, both of which

had been always in evidence, created a crisis-situation when E. P. Richards was asked to survey the city (a century after Nicholas) he was very angry at what he saw.

"very many Europeans who lived in Calcutta possessed little or no knowledge of the dense back blocks that compose three quarters of the city..... Most of us have had no occasion to go about anywhere except in the Dalhousie Square, Old Court House Street, Chowringhee and Park Street area, which make a mere fringe along only half the West side of the built-up mass of Calcutta..... One can walk day after day for hours in the lanes of North Calcutta without meeting a single Europeans.....the general public of Calcutta are not conscious of the state of their city; it has never been put before them forcibly and clearly.....we have all heard Calcutta described glowingly and quite sincerely as the fairest city in the East.... but the speakers are plainly unaware of the real conditions..... Reform measures are looked upon with suspicion, indifference or with a positive and powerful hostility. It should be made thoroughly known that the city is in a most serious condition, and that only prompt, big and concerted action will maintain our commercial supremacy and save Calcuttta and Howrah from becoming the largest slum in the world'. "Comfortable, wholesome family life is being pushed right out of existence in Calcutta. It has already vanished to the extent of forty-five percent... infant mortality and tuberculosis stand at world records'. He estimated that at least 800 acres of 2,500 acres in central Calcutta must be classified as 'rank slum'; at least 250,000 people were living in houses that, under any ordinary by-laws, would be condemned and closed as unfit for human habitation. 'Nearly all the working-class families can afford but a single room in which they have to live, eat, sleep, propagate their species and die'. It is seldom a room of decent size and usually it is ill-lit and badly ventilated and is in a slum or chawl".

Half a century later, the CMPO realised that drastic and swift action was necessary in Calcutta. 'The extreme urgency of the present situation of Calcutta and its region is such.. that the search for new ideas and new techniques must be tempered by the need for immediate action. Calcutta cannot wait for a perfect plan'. So the CMPO produced a strategy to be put into action by stages over two decades, well aware of the fact that towards the end of any twenty-year period in Calcutta a great number of early calculations would be demonstrably unrealistic. Its emphasis from start to finish was on flexibility, making no large assumptions about what any government would or would not do, but developing a machinery for application in the field under any political philosophy. It was rigid only in its selection of early priorities. And, overwhelming as some of the earliest tasks would appear to anybody preparing to tackle them, the planners were confident enough to suggest that 'with the combined and concentrated efforts of Government, private industry and commerce, and of voluntary organizations, a steady progressive improvement in the situation can be accomplished, leading to cumulative and dramatic change in the urban environment of Calcutta within a generation'.

The very first priority was to stop things getting even worse than they were when the CMPO was devised. The planners pointed out that it would be completely unrealistic to assume that the bustee dwellers could be rehoused in decent, safe and sanitary pukka buildings within a decade, except in very limited numbers. Before they could be rehoused, there would have to be space in which to rehouse them, and space is the rarest thing of all in Calcutta. The first step must therefore be reform of land-use, beginning with the compulsory purchase of all bustee lands. Once the civic authorities or the government took possession of the bustees, the slum improvement agency would then move in and provide the minimally acceptable requirements in the way of water supply, drainage and lighting. And there the bustee dwellers would remain for quite a while longer, still shockingly over-crowded but at least living in approximately healthy conditions for the first time since they were born. The planners proposed that simultaneously the authorities should seize any vacant land that became available and merely furnish it with a network of services; after that, they should allow people to move in and build their own makeshift dwellings as so many of them have had to do ever since they came to the city, without benefit of any services at all. The CMPO plan estimated that if these suggestions were promptly carried out in 1966, half a million people in Calcutta and Howrah would by 1971 be provided with paving, lighting, sewerage, safe water points and communal bathhouses for one sixteenth of what it would cost to mount an orthodox slum clearance programme. Meanwhile, the authorities could spend the bulk of their available funds where they were most needed, in the improvement of the existing water supply for the entire community to tolerable safety level, in the beginning of three new townships to siphon some of the population for the most congested areas, in the conversion of the ghastly service privies to sanitary latrines, in the first steps towards a rapid transit system to prevent Calcutta from choking itself with its own traffic".

GEOFFREY MOORHOUSE, 1971.

The 1960s, was the worst period in Calcutta history. By the mid 1980s, however, the

comment that Calcutta was "a dying city" was realised to have been off the mark. M. N. Buch in an article in 1985 commented, almost with surprise, that Calcutta had started to revive. It is obvious that the solution of earlier centuries, of abandoning towns, is not practical any more. It is also not necessary to have all towns going through the Calcutta cycle of life-to-death-to-renewed-life. The future must be anticipated. It must also be worked towards in a spirit of commitment. Recommendations without commitment are worse than useless.

SUMMARY

When Leuis Munford publish his *City in History* in 1961, the book contained nothing about India. It is hoped that what has been described in the previous chapters will indicate that his omission was due to lack of available data, not to lack of history!

Conclusions :

1. Regional settlement patterns in India have remained fairly consistent through history.
2. Town planning reached a high degree of sophistication and adaptability in the pre-British era.
3. The quality of life in small urban communities gets diluted as urban areas grow with and has only partially became replaced by a sense of the neighbourhood.
4. Though many Indian towns have an antiquity and a viability which make it possible for them to sustain a burden of demographic increase, in many towns urban services have become strained to a critical degree.
5. The unprecedented demographic and spatial growth of the last century has been accompanied by, initially, a virtual absence of planning and, subsequently, by a plethora of diagnoses and paper planning. Independent India has also seen an excess of theoretical planning at the macro-level over actual activity at the micro-level.
6. The abundance and accessibility (through the English language) of Western Urban Theories have meant that these have a powerful hold on Indian scholars and planners. This has made them oblivious to the specificities of the Indian situation.
7. Housing, recognized in recent decades as being a major need, has often become excessively hierarchical.
8. The use of public spaces has changed over time, and a sense of identity with and even identification of these is necessary now.

ANNEXURES

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Determinants of Built Form

H. P. Bahri, Neelima Risbud and K. G. Malik
School of Planning and Architecture
NEW DELHI 110 002


सत्यमेव जयते

PREFACE

This study, 'Determinants of Residential Built Form', has been undertaken by the authors in the School of Planning and Architecture, New Delhi as per the request by the 'National Commission on Urbanisation' in May, 1987, for its Working Group on 'Determinants of Built Form'. Like other studies being undertaken for the Commission, the intention in this case also has been to help in the formulation of policies for balanced and desirable urbanisation of our country.

The objectives of the study were to examine the existing patterns of residential built form and analyse the variations in relation to certain identified objectives relating to environmental, economic and social entities of desirable habitat on the one hand and review the state-of-the-art in the field of housing development on the other, in the light of various governmental supports and controls. The objectives were also to recommend modifications in the nature and extent of governmental interventions needed to ensure that our habitat has the desirable environmental qualities.

The study has been carried out with the help of empirical studies covering a variety of housing typologies and sub-systems by taking Delhi as the case study area. Secondary source data has also been used to arrive at conclusions.

The study has been divided into three major parts. In the first part, the factors influencing the built form patterns and the objectives of desirable habitat in the present context have been identified and the effectiveness of existing development controls has been analysed. The second part analyses various built form patterns in Delhi in the context of the housing objectives. The last part synthesizes the findings from various case studies and proposes a framework of development regulations.

It may however be mentioned that such regulations are effective at micro level only but cannot alter or modify housing supply/demand situations. The recommendations are made in the context of Delhi's scenario of socialisation of land and therefore emphasise on various norms of development. With the change in the land scenario and housing supply system, higher level policy interventions are required to regulate the private market in terms of various incentives and disincentives and would require very efficient and sensitive monitoring mechanisms. Development controls, although one of the major tools to regulate development, cannot by themselves achieve social justice, community development and improved housing situation but needs to be integrated effectively into the supportive policies, programmes and projects of the government.

We are grateful to the Chairman of the National Commission on Urbanisation and Members of the Working Group on 'Determinants of Built Form' with whom we had a series of sittings with a view to interact and arrive at a consensus on various issues so as to decide the general direction and areas of thrust which the Study Group should concentrate on,

7.—329 M of Urban Dev/ND/88

We are also grateful to Prof. Bruno Dias Souza and other colleagues in the School as well as professionals outside who have contributed by way of interacting with the Study Group from time to time, thereby making the task of the Study Group easier, effective and more specific. We are thankful to all the professionals and agencies whose secondary source data has been used in this study.

Our thanks are also due to the Registrar and the administrative staff of the School of Planning and Architecture, New Delhi, for having extended all the possible facilities needed for this study.

H. P. BAHRI
NEELIMA RISBUD
K. G. MALIK

MARCH 21, 1988

CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Objectives of study

Any city is comprised of a large portion of land under residential uses. They are a mix of several shelter options which range from the palatial bunglow to the multi-storey flat, the inner city 'katra' or the mud walled squatter. This means a variety of built forms all over the city. One invariably finds that most of the areas in almost all our cities today have built form patterns which are neither functionally useful, environmentally efficient, psychologically satisfying nor aesthetically pleasing. The quality of life in such areas could be very distressing. Thus, it becomes necessary in view of the desirable qualities we want our habitat to have, to identify the forces which have shaped varying built form typologies as they exist today. The determinants of built form need to be identified so that appropriate framework of regulations could be suggested. Therefore, the objectives of this study are to :—

determine the qualities we want our habitat to have,

define the determinants of built form in the present day context in Delhi,

review the state-of-art in Delhi against the housing objectives,

examine the major governmental supports and controls,

identify suitable built form patterns for the future,

recommend modifications in the nature and extent of governmental interventions.

1.2 Scope and Methodology

The findings are based on empirical studies of various built form patterns which are within the broad framework of standards of the Delhi Master Plan. However, formulation of detailed standards is not within the scope of this study. The study of densities, built to open space relationship, land uses, characteristics of public intervention in terms of building bye-laws and other regulations fall within the scope of this study. This is done on the basis of inferences drawn from certain examples representative of different built form patterns. Use of secondary source data was made in this analysis and was supplemented by field studies.

The built form pattern is affected by housing process, modes of land supply (both legal & illegal) and govt. policies towards such developments. In the context of Delhi, the land policy was based on the principle of socialisation of urban land through large scale acquisition & disposal. The failures and successes of managing the urban development in accordance with the policy are reflected in the planned and unplanned developments of Delhi. Delhi also is an example where development regulations were enforced by the Delhi Development Authority under the provision of Delhi Development Act.

In other cities, development regulations in the form of building bye-laws & subdivision regulations are enforced by the Municipal agency. This study primarily draws from the experiences of Delhi and therefore does not claim to provide general prescriptions suitable for all situations in various cities. However, an effort has been made to identify specific factors which shape the built form in cities.

The following methodology has been adopted: –

The scope of housing and the broad housing objectives in the context of the present housing situation which include the environmental, social and economic attributes of habitat are defined.

These objectives are then translated into tangible indicators of landuse, density, built to open space relationship, and other socio-cultural factors.

A typology of residential area patterns depicting a variety of built form is established on the basis of physical components of residential areas and the extent and nature of government regulations applicable to it. Classification of areas has been done in the following manner :

A. Organic—which have evolved over a period of time in response to socio-political structure of the society and is subject to market forces.

B. Planned—areas which have been subjected to various government regulations and norms.

C. Unplanned development—housing areas which have developed in response to present socio-economic characteristics of population and is subject to all market forces.

These residential areas are studied and evaluated against the indicators as mentioned above to establish attributes and deficiencies.

Factors which have been responsible for influencing the built form in each of the areas are identified (e.g. community, market, government regulations and site characteristics).

Desirable patterns of residential areas and the nature of government regulations required to achieve them are recommended.

1.3 Summary of proposals

(1) A set of development regulations cannot by itself control housing prices and improve housing supply and distribution. Public interventions through various instruments of urban land policy and management have to be effectively used to improve the housing supply scenarios.

(2) Minimum levels of livability in terms of living space, facilities and services be ensured by regulations. These should not be sacrificed for economic or affordability considerations.

(3) Housing standards vary with varying income, lifestyles, land and construction prices, technological options and climatic considerations, appropriate standards should be worked out for specific situations in a city, within a broad policy framework. These broad parameters have been spelt out in this study.

(4) Effective enforcement machinery for development regulations is a precondition to achieve desired results. Simplified procedures are required to eliminate delays. Local authorities should be adequately staffed with skilled personnel.

(5) Fiscal measures supported by effective legislation are required not only to control but promote development in desired directions.

(6) The time gap beween plan making & plan implementation needs to be minimised. An urban information system is essential for regular monitoring & enforcement of regulations.

(7) Development controls for existing built up areas are greatly constrained by legal status of the development, legal tools available, layout of the area and motivation of resident community. The character and function of inner city housing or squatter areas varies from city to city and therefore local plans & suitable standards for improvement/renewal of existing areas is to be worked out for specific area.

(8) Suitable measures be taken to effect redensification of existing low density underutilised areas and vacant plots. This is possible by permitting higher densities/FAR, augmentation of infrastructure, enactment of apartment act and taxation of vacant lands.

(9) Minimise development controls to the minimum essential. Provision of community facilities, public open spaces proper accessways minimum living space and intensive use of land are critical factors which need to prescribed and enforced.

(10) Subdivision regulations of all municipal bodies should include allocation of land for community facilities and open spaces. Average land required for these uses is about 33.5 sq.m./family. This provision does not vary with changing density.

(11) Building regulations for plots below 100m^2 could be minimal. Maximum coverage of 75 per cent, minimum size of ventilation courtyards 2.4 × 2m, maximum number of two stereys and fire resistant building material be ensured.

(12) Building regulations for plots above 100m^2 be as per National Building Code.

(13) Every household should ultimately be able to have one room, a small kitchen, individual bath and w.c. A minimum plot of 26m^2 can provide vertical incrementality to provide for one additional room.

(14) There is a need to limit maximum size of plot to reduce the gap between minimum and maximum plot size and to reduce the land consumption/family. The maximum plot size in new developments should be 250m^2.

(15) Smaller plots upto 50m^2 be grouped in such a manner to provide immediate semi-private open space for every plot. On an average 6m^2 of such space/plot be provided.

(16) Plot layouts should provide for anticipated commercial uses and integrate it with higher hierarchy of road networks.

(17) About 75 per cent plot coverage could be permitted on plots upto 50m^2 and 66% on plots upto 250m^2. Property setbacks need not be insisted upon as long as each room has external light in two storeyed plotted developments.

(18) No violation of regulations be compoundable and no projection outside the property line be acceptable.

(19) Maximum feasible densities have been worked out after deciding minimum plot sizes and facilities. Maximum incremental densities of 900 ppha can be achieved in two storeyed plotted development.

(20) Maximum instant densities of 1000 ppha can be achieved in four storeyed apartments.

(21) It is desirable to mix dwelling categories in which case average densities of 700 to 750 ppha can be achieved in plotted development. When compared with average density of 400 ppha proposed in Delhi Master Plan-2001, the average density of 700 ppha effects a gross land saving of 50m^2/family which is quite substantial at city level.

(22) Basically plotted development has been proposed as it offers advantages of incrementality participatory development and at the same time enables higher residential densities at saturated stage of development.

(23) The four storeyed group housing enables instant densities and is suitable form to achieve higher densities with larger dwelling sizes. Immediate habitation of housing area leads to immediate utilization of infrastructure services and promotes quicker development of facilities & commercial use due to higher consumer demand.

(24) In large housing developments, group housing acts as catalyst for development and offers lesser scope for speculation. A composite development of plotted & group housing is most desirable.

(25) A variety of built form patterns responsive to preferences, values and activity systems of various groups can possibly be generated at micro level by granting greater freedom and flexibility to identified organised groups personalise to the built form within broad policy parameters.

(26) Residential layouts be designed to achieve economy and efficiency of land utilization & management. This can be achieved by maximising saleable area minimising public area and clearly delineating private, semi-private, semi-public and public uses of land to effect better management & maintenance.

(27) Use of local and semi-permanent building materials be acceptable in building regulations, government manuals and schedule of rates. Detailed recommendations of the Working Group on "Materials and Technological Options" be also incorporated.

(28) Municipal regulations should accept minimum pedestrian access-ways of 3M width for two storeyed developments. No property should be at a distance of more than 50M from a vehicular road to enable fire fighting and provide convenient access for ambulance.

(29) Road specifications could be improved incrementally but road widths be designed considering the nature & volume of movement generated at saturated stage of plotted development.

(30) Low cost options for waste disposal and incremental provision of infrastructure be acceptable in municipal regulations. Maintenance free/low maintenance options be preferred for low income high density developments.

(31) Public support be mobilised for effective enforcement of regulations. This is possible through better public relations & involvement of people in the plan making & implementation process.

CHAPTER 2

DETERMINANTS OF RESIDENTIAL BUILT FORM AND OBJECTIVES OF DESIRABLE HABITAT

2.1 Introduction

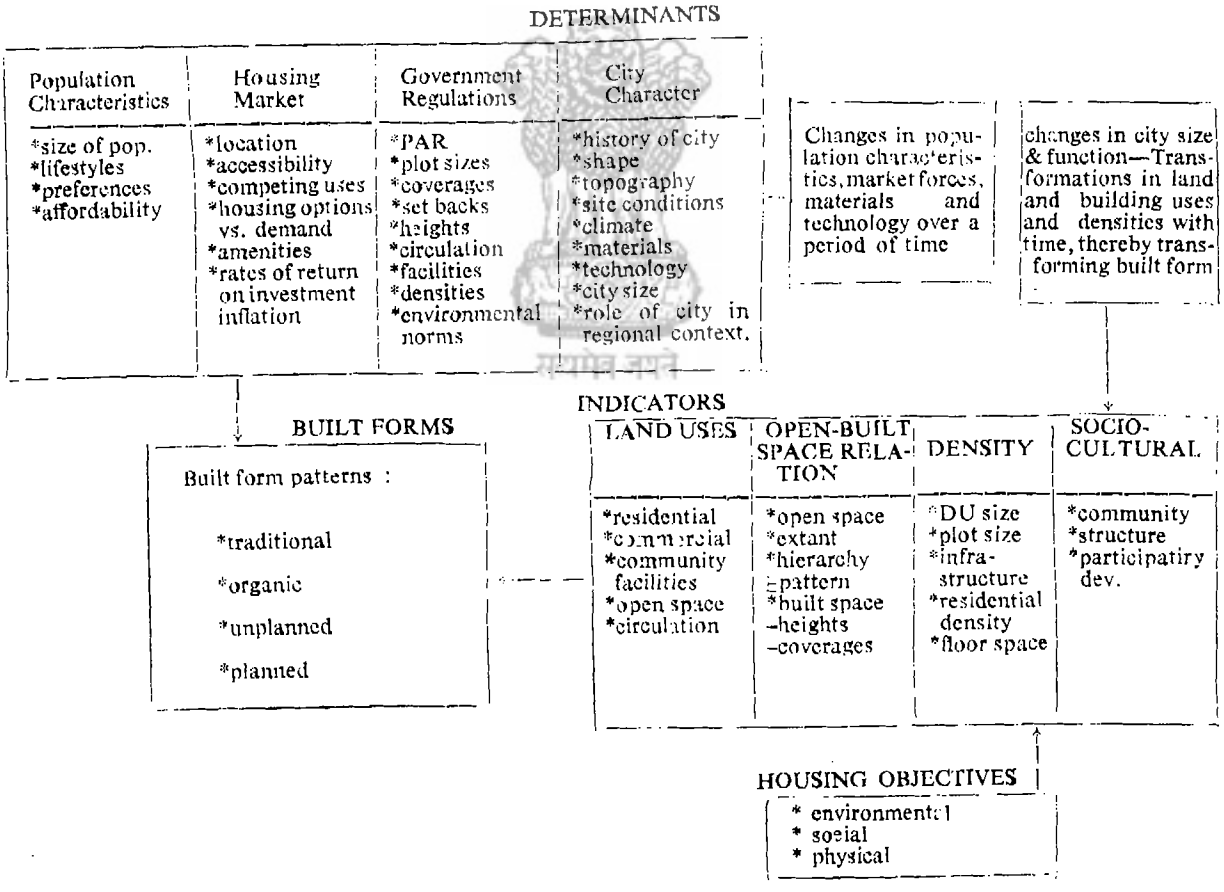
The configuration of urban space is determined by various factors such as the socio-economic and demographic character of cities, history, topography, climate, land availability, the perception of space by the different actors that are involved in and have control over city building, (families, communities, public agencies, private developers). While people and communities can and very often do determine space disposition and use in their own immediate surroundings, public agencies are responsible for overall control in the form of norms, standards, plans and building controls.

It is widely accepted that norms, standards and building controls are crucial to urban development. They can be used as a powerful tool to bring about proper utilization of resources, in promoting 'people friendly' development and in improving the quality of life. This implies that the desirable qualities of urban habitat must first be determined alongwith the patterns of built form that would bring them about. This chapter examines the determinants which are influencing urban residential form in the present day context and also sets the objectives for desirable habitat.

2.2 Determinants of Residential Built form

Broadly, built form is the physical manifestation of various activity systems in a city and the reflection of the needs and aspirations of people. Different land uses generate different built forms. However, within each, there could be several variations which stem out of a variety of factors. For example, a residential area could have either multi-storeyed flats, bunglows or hutments. The pre-dominant land use of a city being residential, the built form in residential areas assumes

Built form Patterns, Determinants and Indicators



significance and reflects to a great extent the image of a city. Housing form is greatly influenced by its relation to settlement forms and cannot be isolated. External constraints of overall layout affects internal design of the house to very great extent and therefore the analysis of residential built form includes the relationship of individual house to the settlement system as a whole.

The existing pattern of residential areas is not an exact reflection of immediate and current space requirements but rather a reflection of the cumulative needs over a period of time which has arisen from differing requirements of various communities and various uses within a varying framework. This framework comprises of four major determinants. These are the population characteristics, housing market characteristics city characteristics and govt. regulations. Whereas population characteristics and housing markets change over a period of time with changes in city size, city characteristics, govt. regulations have remained the same over several decades and therefore has not been responsive to the population needs & market demands. These imbalances are reflected in the built form patterns in the city.

2.2.1 Population Characteristics

2.2.1.1. **Affordability.**—The income of an household and its capability to pay for housing strongly constraints the amount of space and intensity of residential use in our cities. In view of the rising prices of land and construction, low affordability of population result into very small dwelling spaces, higher occupancy and multiple use of space. However, economic capacities of population should be considered as a constraint of housing and not a determinant of a residential form. The rise in prices is related to location, accessibility, amenity value and environmental quality of residential areas. Therefore households with low affordability are forced to accept housing options with very poor environmental quality in far away locations, deficient in basic services and amenities. The recent emphasis of professionals on affordable housing prices has led to drastic reduction in plot sizes and level of services as the housing market is not balanced, the prices are not indicative of the true value but are speculative in nature. With the present nature of affordability of households, a significantly large portion of our population will not be able to afford even minimal living space. Even with these resource constraints, different population groups make different housing choices and have different priorities.

2.2.1.2 **Lifestyles.**—The lifestyles of people are important while designing residential environment. Individual preferences vary widely which is reflected in the manner in which people express themselves in the built form patterns. It is important that environmental quality must be understood and evaluated in its cultural context as defined and understood by the user group itself. The urban community consists of wide variety of social groups reflecting sometimes conflicting values of activity space relationship. The rural lifestyle of migrant squatter communities and the westernised urban life style of neo-rich all co-exist side by side reflecting contrasting built-form patterns. This duality is becoming more pronounced with about 30% of the urban population living in slums & squatter reflecting a rural way of life of habitat. These groups need not be low income groups but are natural groups; those which identify themselves on the basis of perceived homogeinity. Social cohesiveness is thus an important factor. The scale and spatial character of the housing cluster and organisation of dwellings for a group is very critical. The reduction of dwelling space depends on the use of outdoor space. Thus, similar layouts are not suitable in groups with diverse social characteristics. This consideration should be given to different layouts, groupings, sizes of plots, circulation systems. House form is the result of existing options available. The greater the number of options greater are the choices. Efforts should be made to increase choices to cater to varying changing tastes.

2.2.2 Housing Market Characteristics

The housing market in our cities shows great imbalances of supply and demand. The supply invariably excludes low income groups. Supply of developed land is greatly constrained by land prices & speculative tendencies of the market. Although there is shortage of housing on the basis of the needs of low income population, to some extent the demand in housing is also a reflection of the investment needs. A large amount of land in our cities is controlled and owned by very few people. This scarcity is reflected in terms of prices. Whereas construction cost in the last two decades has increased four times, the rise in land prices has increased almost 20 times. This has made investment in land one of the most lucrative propositions. In view of this, there is a need to utilise land efficiently and intensively. There are other competing uses like commerce which compete for space in residential areas and further contribute to increase in prices. The low income households thus select the most affordable options in the market. Locational advantages are important market considerations in the central areas, prestigious locations or areas with good accessibility. These areas show higher market prices and this leads to intensive/over-utilization of land, thereby deteriorating the quality of environment.

2.2.3 Characteristics of the City

The city size, the city shape, historical growth trends & role of the city in regional context influence the settlement patterns and land use

configuration within a city. Topography and site conditions determines the intensity with which the land can be seen in vernacular architecture of traditional settlement when condition of weak technology existed. In the modern context climatic considerations for design are gradually getting replaced by economic considerations and modern social values. However, climate needs to be given due importance in design today firstly to conserve energy and secondly to provide comfortable living conditions for the urban poor who do not have access to electric gadgets for altering the material comfort condition in the dwelling. The rate of growth of the city affects the housing demand & supply relationship & thus influences land prices & built form transformation.

2.2.4 Government Regulations

In most of the cities housing development is regulated by development controls which include sub-division regulations, building bye-laws and zoning laws. Most such regulations were designed with the primary objective of promoting health, safety, morals and general welfare of the community to regulate haphazard growth. Traditionally development control in urban areas has been administered by municipal bodies. Thus we find that right from the inception these regulations were framed with environmental and aesthetic consideration with almost total disregard to social and economic characteristics of the community. The system has over a period of time become a major constraint on the development process rather than a regulator and promoter of development. Major portions of housing in our cities developes outside the framework of these regulations. They have been found inadequate to cope up with rapid pace of urban growth. A common defect in sub-division control under most municipal acts is that while subdividing land, the developer is not obliged to reserve land for open spaces and community facilities. Also there is no control on minimum size of plot, as a result of which extensive sub-division of existing built up areas is common.

The building rules specify standards relating to structural safety of buildings internal dimensions of rooms, light and ventilation, set-backs and coverages on individual plots. These are specified to ensure safety of residents' proper light and ventilation. Densities and floor spaces are specified keeping in view the capacity of infrastructure. Height of buildings is regulated on consideration of adequate day light, fire fighting requirements and set-backs were specified to ensure privacy and enhance aesthetics of the street and provide scope for street widening.

These standards are often normative and prescriptive and have produce monotonous regimental residential patterns. They have absolutely no relevance to the housing needs of the lower income groups. The enforcement of Development controls tends to be quite ineffective due to inefficient and inadequate administering machinery, cumbersome procedures, rigidity of provisions and inability of the system to be responsive to public needs and desires. Considering the future estimates of enormous population growth, there can be little doubt that the development controls need to be simplified and more effective to ensure decent, affordable and efficient housing forms.

These four factors are active in varying degrees and influence the built form. Whereas the population characteristics and the housing market change with time continuously with the change in city size, the regulations for built form have tended to be static for a long time. There are some developments which have emerged in a strict adherence to regulations and are not always responsive to market and people's characteristics resulting in a development which is neither economically efficient not socially satisfying. There are other organic and unplanned developments which have emerged as a direct response to the market situation and peoples needs, the example of which are squatter settlements and unauthorised colonies.

2.3 Environmental characteristics of residential areas

Two basic factors condition the environmental quality of residential land use. Firstly, it is the importance of non-salable (non-profit) uses particularly the roads, community facilities (educational, health and other amenities) and open spaces in the form of parks and playgrounds. In the development of a residential area, land is automatically divided between land developed by persons responding to the profit motive (private land) and which is used for non-profit purposes (public land). The quality and intensity of use of private land (area under plots) depends on the nature and extent of non-profit uses provided. Thus the profitable use of private land is extremely constrained by the complementary provision of non-profit uses. Secondly, the quality and intensity of a residential area is influenced by the provision of services which include water supply, sewerage disposal, storm water drainage, electricity and other services.

These two factors can be considered as the thresholds for the intensity of residential use that can be permitted on private plots (in terms of both density/floor space) if desirable standards of residential livability is to be ensured.

It is in the provision of public uses (facilities), that the role of the government becomes important to achieve the overall community objectives. Government legislations in the form of zoning regulations, land sub-division regulations and building bye-laws are the instruments

which public agencies have been using to ensure a better quality of residential environment. The pre-occupation of professionals with the environmental aspects alone has led to an inflexible framework that has led to a 'sterile' built form pattern in the planned areas. However, the experience of the last few decades has shown that these tools have neither been effective in bringing about improvement in the quality of life in residential areas, nor have they been responsive to the socio-economic context of our cities. As a result of this, to a very large extent, residential areas are developing outside the legal framework of development.

Therefore, it is essential to identify the housing objectives that we need to persue in order to promote the creation of environments that are more responsive to the socio-economic and cultural aspirations of our communities. Today, one finds that the majority of the population in our cities have lower paying capacities towards housing because the percentage of households with lower incomes is increasing rapidly. There is, thus, an increasing demand for housing. The meagre supply has resulted in tremendous increase of land prices. The demand is high not only for residential space but also for commercial space. This can be observed from the scale of transformations taking place in various colonies in Delhi. Due to increasing and competing demands for space along with rising prices and decreasing paying capacities, the affordable residential built space is decreasing day by day. The situation attains greater complexity due to the tendency of people to buy more land than they can effectively build upon. This tendency of 'land hoarding' is exhibited in unauthorised colonies where large unserviced plots have been purchased with a view to speculate or subdivide in future. The demand is also exploited by private colonisers by illegal subdivisions and sale of unserviced land by maximising saleable area, thereby not providing for any facilities.

The results of all these, quite obviously, lead to smaller plots and dwelling units undesirably high densities, increasing coverages, overmixing of uses and overcrowding. These ultimately contribute towards a habitat that is neither desirable for healthy living at the micro level nor conducive to overall socio-cultural and economic development. If this is so, then what is the desirable habitat in the present circumstances? This could be elaborated under various attributes related to our environment, economy and social setting.

2.4 Objectives of desirable habitat

In order to arrive at any framework for generating residential built forms for the future, it becomes essential to view the attributes of a desirable habitat in the context of the present day housing situation in Delhi.

Thus, the desirable attributes of habitat (housing objectives) in the present context are :—

A. **Environmental :**

Dwelling unit level

- adequate space as related to the size of average household.
- scope for incrementality of space thereby allowing flexibility.
- sufficient light and ventilation.
- proper access to the dwelling and good linkages with the surroundings.
- appropriate system for the disposal of solid and liquid wastes.
- access to various services like water supply, electricity, etc.
- structural safety and safety form fire hazards be ensured.
- local technology and skills be used to modify micro climate.

At the neighbouring level :

- adequate open spaces at appropriate levels.
- adequate community facilities which include schools, health centres, etc. conveniently located.
- adequate parking facilities for vehicles, (specially middle and higher income housing) have to be provided for.
- easy and effective maintenance of developments.
- community interests of safe environment should take precedence over lifestyles and activities of individuals and small groups.

B. **Economic :**

Considering the present state of economy and the financial capabilities of low income households, following aspects be considered.

- shelter that is affordable initially.
- scope for incremental investment.
- optimum use of resources like land and materials.
- minimising land under public uses to the extent desirable from the functional point of view to achieve better land utilisation and efficient management.
- recycling of resources be promoted.
- energy conserving settlement patterns—high density, low rise technological options which are affordable for both initial costs and recurring costs.

C. **Social :**

- participatory development.
- equity in the consumption of resources.
- greater choice of built form patterns conducive to varying lifestyles for different income groups.
- social and economic differences within community groups be minimised. Gap between the minimum and maximum level of environmental quality be minimised.

Public intervention is needed to ensure minimum desirable level of living to fulfil basic human needs and allow for progressive upgrading of standard of living. The need to decide and implement this minimum standard of housing arises out of the concern to make minimum level of decent housing including essential services, community facilities accessible to low income families who have so far been deprived of these or inadequately catered to in this respect. To be effective, a proper machinery, framework and procedures for enforcement of the habitat code/regulations is necessary to ensure minimum levels of liability and promotion of desirable settlement patterns. Social justice demands equitable distribution of housing resources. Therefore, along with minimum standards of housing, maximum standards may have to be prescribed to the pressure on the scarce resources such as land for the benefit of low income families. This will help narrow down the gap between the poor and rich. The influence of these four determinants on built form patterns and the achievement of housing objectives can be measured with the use of various indicators.

These indicators can generally explain as to what extent a particular development has been able to achieve the housing objectives and what have been the influencing factors.

2.5 Components of a residential area

Provision of space consuming community facilities requires specific allocation of land e.g. area for parks, roads and schools, etc. The network services generally are provided within the area under roads and do not consume separate space. Community facilities are provided in a hierarchical manner depending on size of the facility, the population characteristics and catchment it is expected to serve.

Environmental components of residential area can thus be listed as follows :—

2.5.1 Components of residential built form

2.5.1.1. I. Space Consuming Components

- plot and dwelling sizes, coverages, F.A.R. & set backs & density.
- school-sizes, number & disposition.
- open spaces & sizes, hierarchy & shapes.
- other social cultural facilities area, disposition.
- number & nature of shops, area under shopping & their disposition in relation to.
- roads—road hierarchy, access road widths & area under roads.
- trees & landscaping—within the plot, on the roads and in parks.

2.5.1.2. II. Networks

- water supply
- sewage
- electricity
- drainage
- garbage

Provision of these components is basically related to population size, demographic characteristics and affordability of the population. Whereas space standards in terms of number, area, width, etc. are specified for space consuming facilities, the network norms and always in the form of rate and extent of supply/disposal.

Whereas the standards for community facilities, are governed by demographic and social characteristics of the community, the dwelling unit standards, the density stndards and infrastructure options invariably get determined by the affordability of individual households versus the cost of these components.

2.5.2 Residential densities

In settlement planning, affordable residential density has become an important tool for relating household affordability to housing costs. This has become significant in view of the rising costs of land and development and housing affordability of low income groups. Densities of housing developments are naturally changing at different rates. This increase takes place in two ways :—

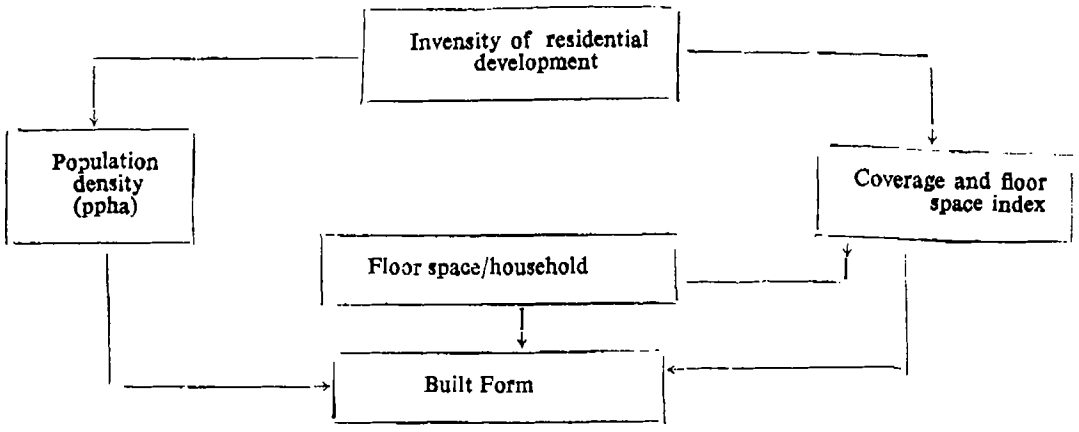
(a) without change in built form due to legal restriction on further addition of floor space. In such cases internal densities increase by subdivision, overcrowding and increased occupancy. Such a phenomenon occurs in the inner city developments.

(b) with changes in the built form. Horizontal expansion in terms of increased coverages or vertical expansion in terms of addition to floor space takes place.

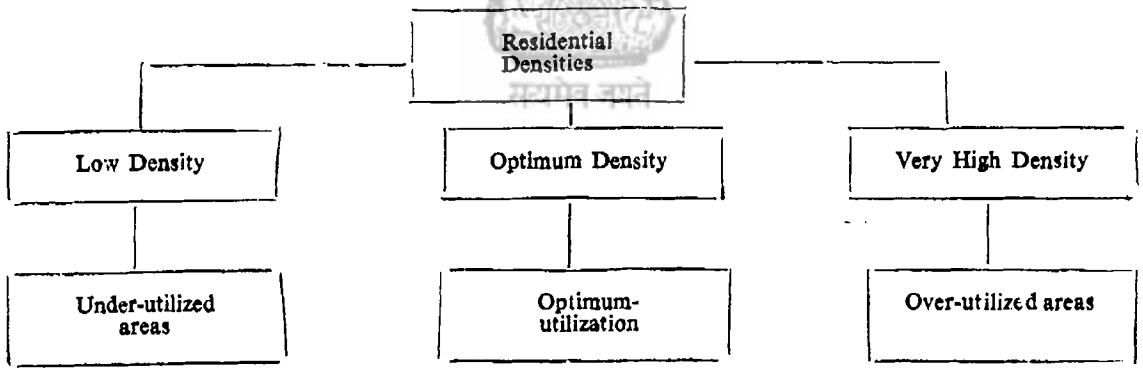
These growth options are more in plotted development which grows incrementally rather than the (pre built) group housing or flatted development which tends to be more or less static. Natural densities within an urban area vary greatly and are influenced by following factors :—

- Land prices.
- Location in terms of accessibility.
- Size and nature of housing demand.
- Non-residential uses competing for space.
- Rate of growth of city.
- Alternate options.
- Affordability of households.

Higher densities do not necessarily imply higher floor spaces. It is possible to have varying built form for the same density with the changes in dwelling unit sizes.



Because of the above relationship, it is possible to achieve low rise high density developments (two storeyed) for low income population with smaller dwelling sizes. Whereas high density development for middle and higher income groups implies high rise developments (4 storeyed or multi-storeyed developments). Considering the pressure on land it is necessary to achieve higher density development for all communities for efficient utilization of land and infrastructure. But we find in our cities that there are areas which are under utilized (low density developments) and there are over utilised housing areas. In both cases public intervention is required to achieve optimal utilization.



2.5.2.1 **Low density areas**

Large number of vacant plots, single storeyed houses exist in many parts of the city with unutilized floor space and infractructure. This has happened because of unrealistically higher planning standards, lack of market demand at that location at a point of time and low economic capacity of the owner to build additional floor space. In such cases incentives and supports to build more and penal actions for under utilization is necessary.

2.5.2.2 **Very high density areas**

This is a result of very high market values due to higher demand in areas with locational advantages. These densities tend to saturate at a point of time. Invariably such areas house low income population with lower economic capacities. Illegal developments are also over built due to strong market forces and lack of effective controls resulting in poor environmental quality.

Thus the trade offs between intensity of use, environmental quality and affordability are critical for desirable patterns of built form.

CHAPTER 3

CASE STUDIES

3.1 Introduction

In this chapter, various built form patterns in Delhi have been examined in detail to identify their attributes and deficiencies. The land policy, housing supply system, norms & regulations for residential development, nature and extent of formal housing supply policy towards informal housing and enforcement mechanism are significant factors which influence various housing processes and built form patterns. In Delhi, the Master Plan has provided the policy context for residential development. Policies for housing development as enunciated in the Master Plan have been discussed first. Case studies representatives of various built form patterns and characteristics have been selected so as to enable a comparative analysis of attributes of deficiencies.

3.2 Delhi Master Plan Proposals for Housing

Objectives for housing development in Delhi were laid down in the first Master Plan for Delhi 1962-81. These objectives for housing development are a part of the overall objectives for planned development. These follow the major policy decisions like socialisation of land and its equitable distribution to all sections of the society.

Standards were worked out for 15,000 population for different densities and all planned residential areas were developed according to these standards. The building byelaws of the Delhi Improvement Trust, Municipal Corporation of Delhi and New Delhi Municipal Committee have now been unified under the Delhi Development Authority Building Byelaws. These are meant to regulate the type of built form that should come up. In addition, there are zoning regulations which permit certain uses and restrict others in different zones.

3.2.1 Structure of residential areas

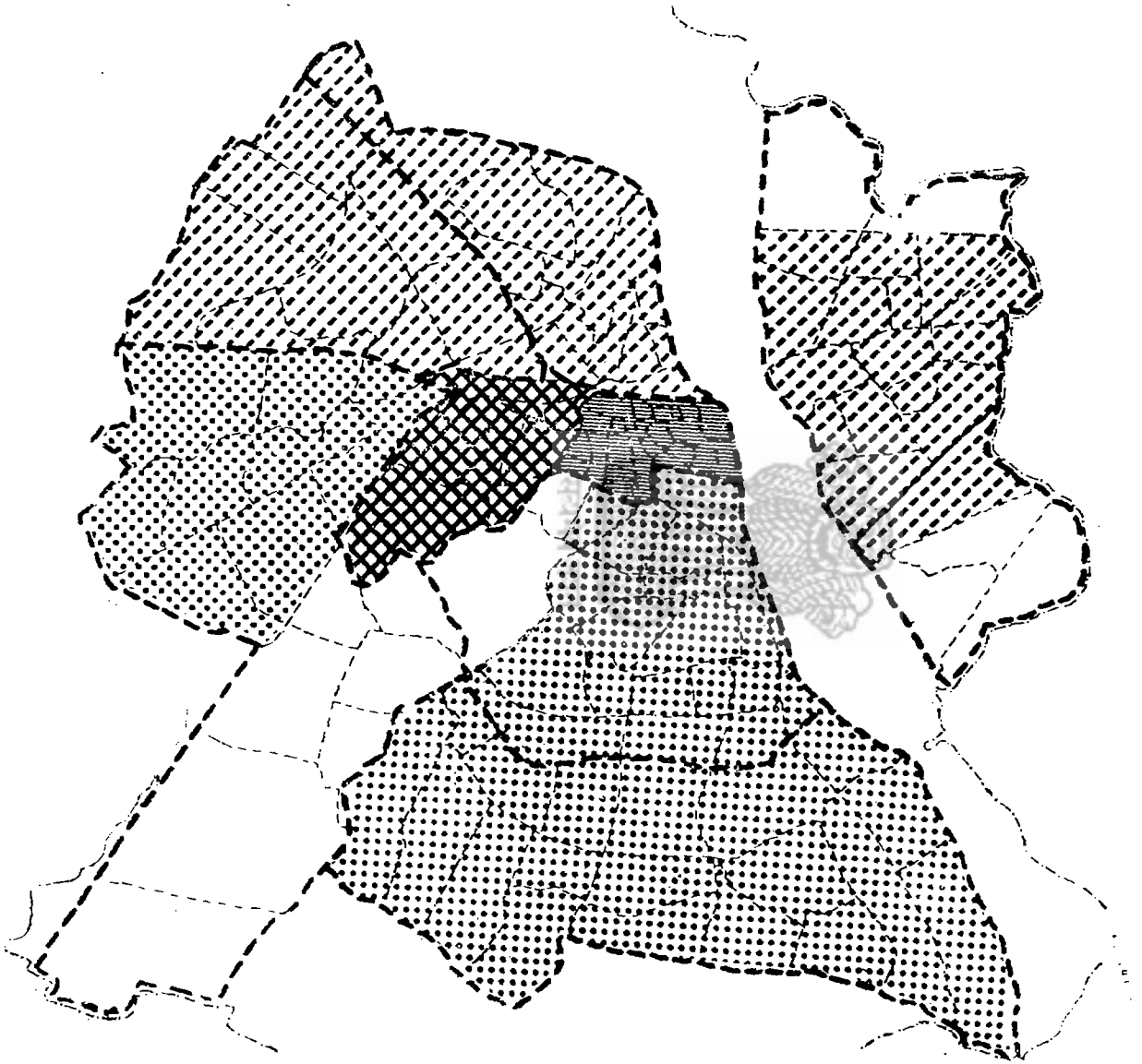
The structure of residential areas as envisaged in the Delhi Master Plan (1961-81) was based on three tiers, the lowest tier being the "housing cluster" containing 750 to 1000 population corresponding to size of traditional "Mohalla" in the Old City. A nursery school and tot lot was to serve as a nucleus for a cluster. These housing clusters grouped together around a primary school and convenience shopping with a small park was a "residential unit" containing a population of between 3500 to 5000. However, for the purpose of wider range of community activities, the "residential planning area" of 12,000 to 15,000 with 3000 families was envisaged with a focus of community facilities which include a high school and community hall with local shopping for daily needs. Space standards were proposed for various units of facilities. Whereas standards for schools were based on level of school, capacity of school and children in the school going age group, the open space standards for tot lots, playground and parks were on the basis of active/passive recreation and hierarchy of open spaces.

Proposed gross residential density varied between 65 ppha to 500 ppha (for residential planning area level 15,000 popn.). The average density was 250 ppha to 350 ppha. However from 1981 census it was found that actual densities were higher than what the Master Plan envisaged. The Master Plan for 2001 recommends an average density of 400 ppha. Standards for facilities and open spaces were provided on a sliding scale and were varying with changes in density. Different set of standards were proposed for "new areas" and "already built up areas".

Both "plotted" and "group housing" developments were proposed. The plotted development provides for detached, semi-detached and row housing with height restricted to two floors only. The minimum plot size for low income groups was 80 sq. yds. Subsequently, the third floor dwelling has been regularised The "group housing" development was envisaged to provide higher intensity of use. These were multi-family dwellings with no limits on number of floors. Higher storey development was encouraged by allowing lesser coverage and higher floor area ratio to allow more open space on ground. The Master Plan also made proposals for redensification of certain areas, decongestion of crowded parts of the city and improvement of slums.

3.2.2 Housing sub-systems and land policy

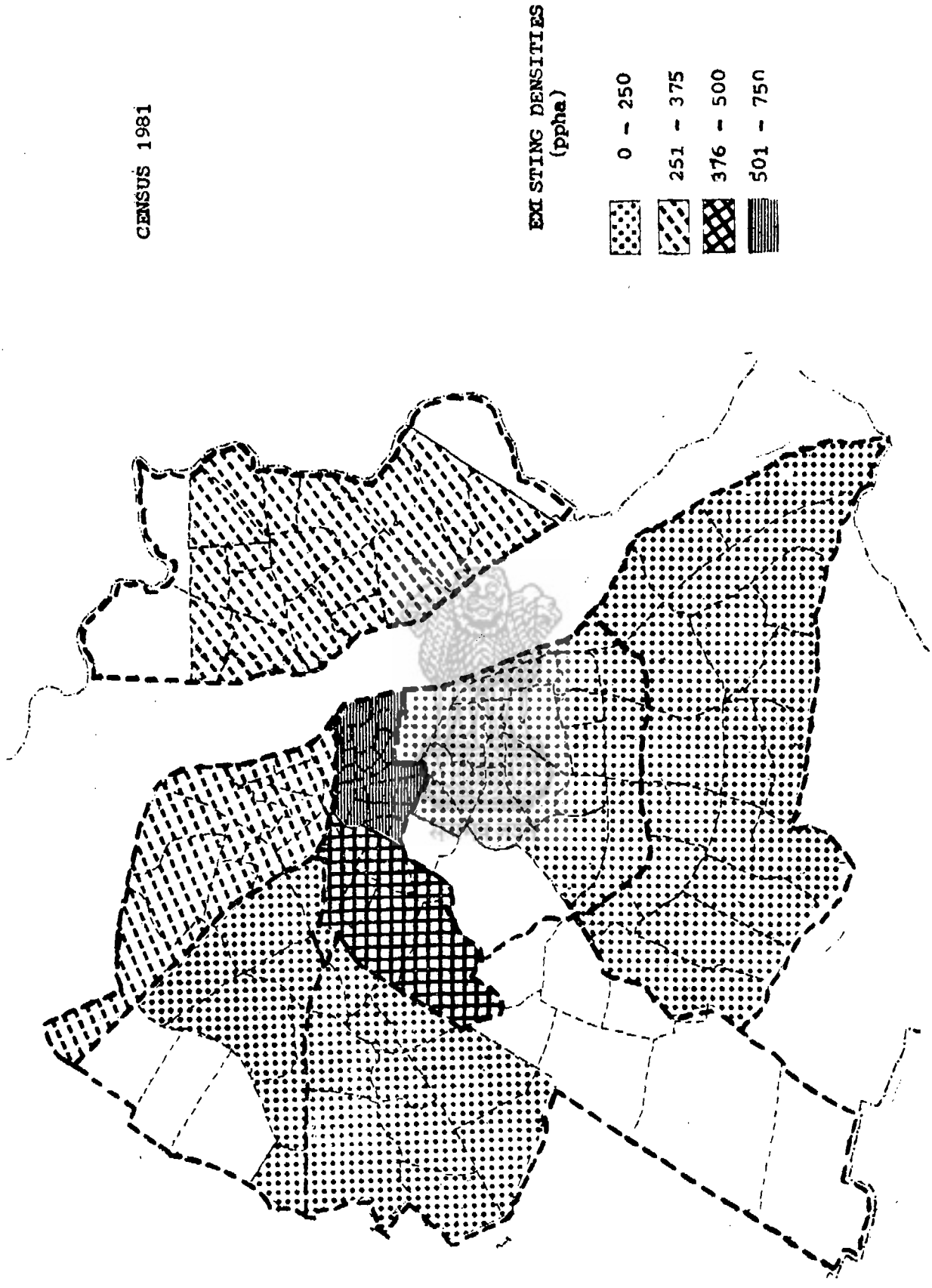
The Delhi Development Authority has been the sole agency which could acquire land through the Delhi Administration, develop and dispose it. Land was 'frozen' since the Delhi Development Act of 1957 came into force and private land development was banned. Land tenure was made leasehold in order to prevent resale and speculation. In short, the housing objectives were to provide planned affordable shelter to the people and subsidising the poorer sections by auctioning



MASTER PLAN 1962-81

PROPOSED DENSITIES (ppha)

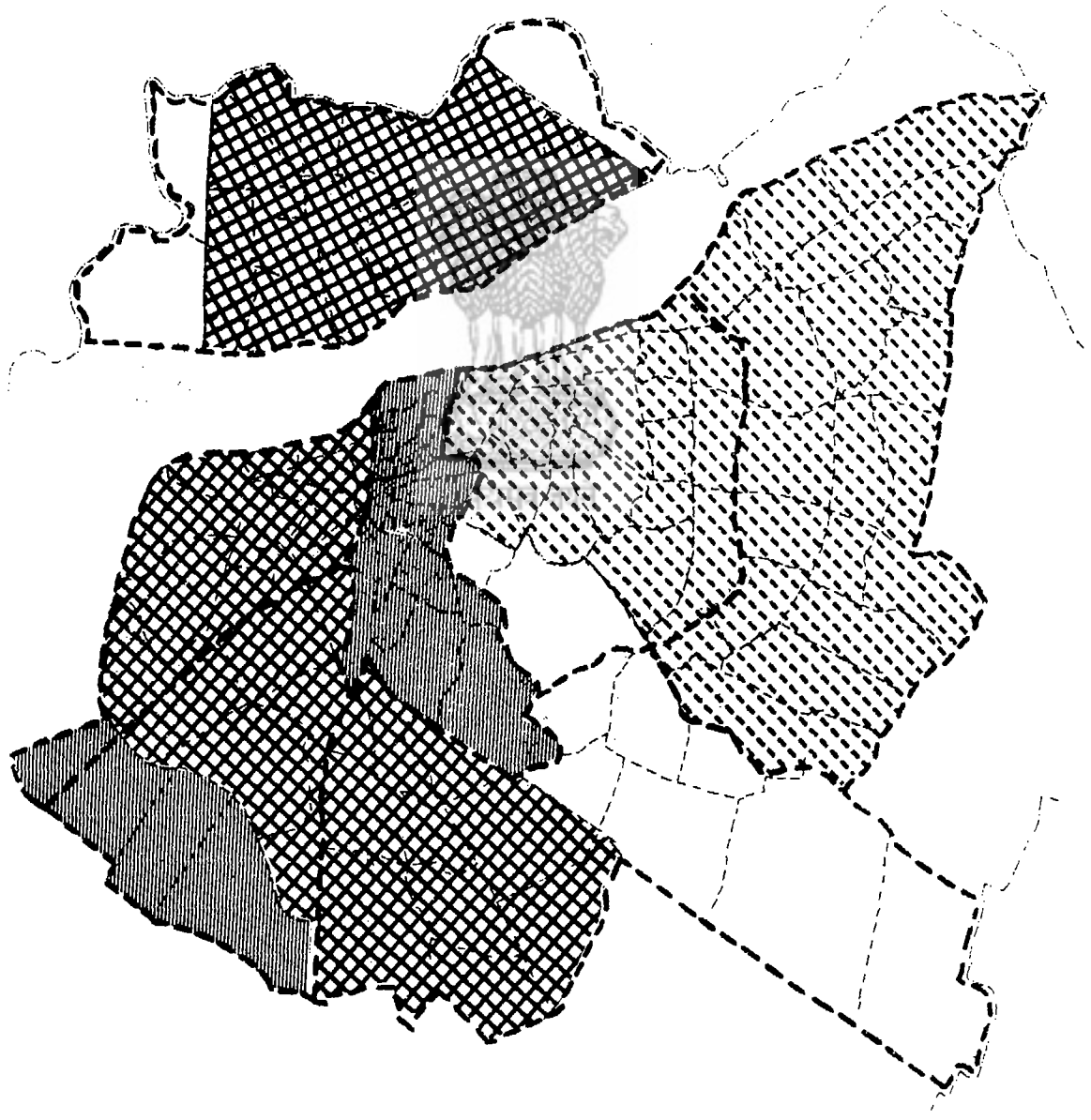
- 0 - 250
- 251 - 375
- 376 - 500
- 501 - 750


CENSUS 1981
EXISTING DENSITIES
(ppha)
0 - 250
251 - 375
376 - 500
501 - 750

HOLDING CAPACITY
DELHI MASTER PLAN 2001

PROPOSED DENSITIES (ppha)

251 - 375
376 - 500
501 - 700



9—329 M of Urban Dev/ND/88

land to the rich. As a consequence, one finds several colonies for various income groups in Delhi developed by DDA. In order to clear squatters, resettlement colonies were developed on a large scale. Areas under slums were improved by slum rehousing schemes. However, for numerous reasons, the demand supply gap could not be kept in control and this has resulted in unauthorised colonisation of land. Although efforts have been made to achieve planned development, we find that almost 50 per cent of the housing stock is outside the planning/development regulations. These include various types of residential areas like the traditional inner city area squatter settlements & unauthorised colonies (refer table no. (1) on housing stock, rate of supply under various housing subsystem.

There are others which have been subjected to partial controls e.g. the resettlement colonies in Delhi where the land sub-division was controlled through a planned layout but there have been absolutely no regulations for building activity. A similar situation exists in slum improvement projects where tenure is legalised through partial or full reconstitution of plots. However, in the absence of any regulations, the building activity continues uncontrolled.

III. Housing Stock, Rate of Supply under various Housing Sub-systems.

Table No. (1)

Sub-system	Housing Stock 1986		Rate of Supply	
	Average No. of DUs	%	Av. No./ year	%
1. Old City .	60,000	4·3	..	..
2. Urban Villages	89,000	7·3	1,800	3·5
3. Rehabilitation colonies	64,827	5·3	..	..
4. Govt. employees' housing .	82,558	6·7	2,088	4·0
5. Private housing	1,22,836	16·3	9,356	10·1
6. Co-op. plotted housing . .	1,11,452	..	..	..
7. DDA's plotted development .	65,000	..	..	..
8. Slum rehousing	16,717	1·3	241	0·4
9. Unauthorised/ Regularised colonies . .	2,48,504	20·4	11,309	21·9
10. Squatter settlements . .	1,13,186	9·2	8,637	16·7
11. Resettlement colonies .	2,14,108	17·5	3,285	6·3
12. DDA Group Housing .	1,11,569	9·2	11,675	22·67
13. Co-op. Group Housing .	16,514	1·3	3,102	6·0
Total Housing Stock . .	12,17,271	100	51,493	100
Total Housing Need . .	14,22,320	..	42,865*	..

*Excluding Squatter Settlements.

Source : Shelter paper, Delhi, 1986-2001-DDA.

A third type of development is the one which is covered under the category of planned development. These are subjected to detail scrutiny and approvals by local agencies in terms of land subdivision, land use density coverage, FAR and detailed building regulations.

The major drawbacks of the existing development regulations are:—

— High space standards which are unaffordable,. Low densities which generate large plot sizes that are affordable only by higher income groups and leads to under-utilisation of land or urban sprawl (low rise low density development).

— High standards of facilities which lead to reduced saleable (private) area.

— High space standards for road widths and road specifications.

— Total emphasis on vehicular movement—multiple use of space is not considered.

— A wide gap between maximum and minimum plot sizes.

— Group housing is not conducive to peoples participation, does not achieve higher intensity and is not suitable for lower income groups.

— Rigid bye-laws regarding:—

0 set backs

0 materials of construction

0 infrastructure

Incremental infrastructure provision is not accepted.

— Development framework is rigid and does not allow personalisation, choices and flexibility in built form patterns to respond to changing preferences, activity systems, lifestyles and climatic considerations.

— Auctioning of residential plots has contributed towards steep rise in land prices.

The public agency is required to play a dual role not only of sanctioning but also monitoring any deviations and violations later on. The agency tries to be very stringent in playing the first role whereas it becomes almost a helpless spectator to gross violations in terms of property use & structural changes taking place in the planned development. These changes are so rapid and widespread that enforcement of development control & penal action within the framework of existing procedures and provisions is not possible in a soft State like ours.

The urban property market which is so active and buoyant is greatly responsible for these distortions and changes. The market consists of individual property owners and entrepreneurs who would like to maximise gains in response to demand. The urban property market is very dynamic and is changing constantly with changes in size and nature of demand and government's policies.

Thus, one finds today in Delhi a mix of planned, unplanned, organic and traditional housing sub-systems, The following subsystems have been identified:—

Built form Patterns	Housing subsystem
(1) Traditional .	Inner city housing area
(2) Organic . .	Urban village
(3) Unplanned .	Squatter settlements Unauthorised colonies
(4) Collonial bunglow	New Delhi bunglow area
(5) Planned plotted detached houses .	Private housing DDA housing Co-operative housing
(6) Row housing .	Resettlement colonies D.D.A. plotted housing
(7) Group housing .	Co-operative group housing D.A.D. group housing

Examples from each of these patterns have been taken and analysed in a manner so as to :—

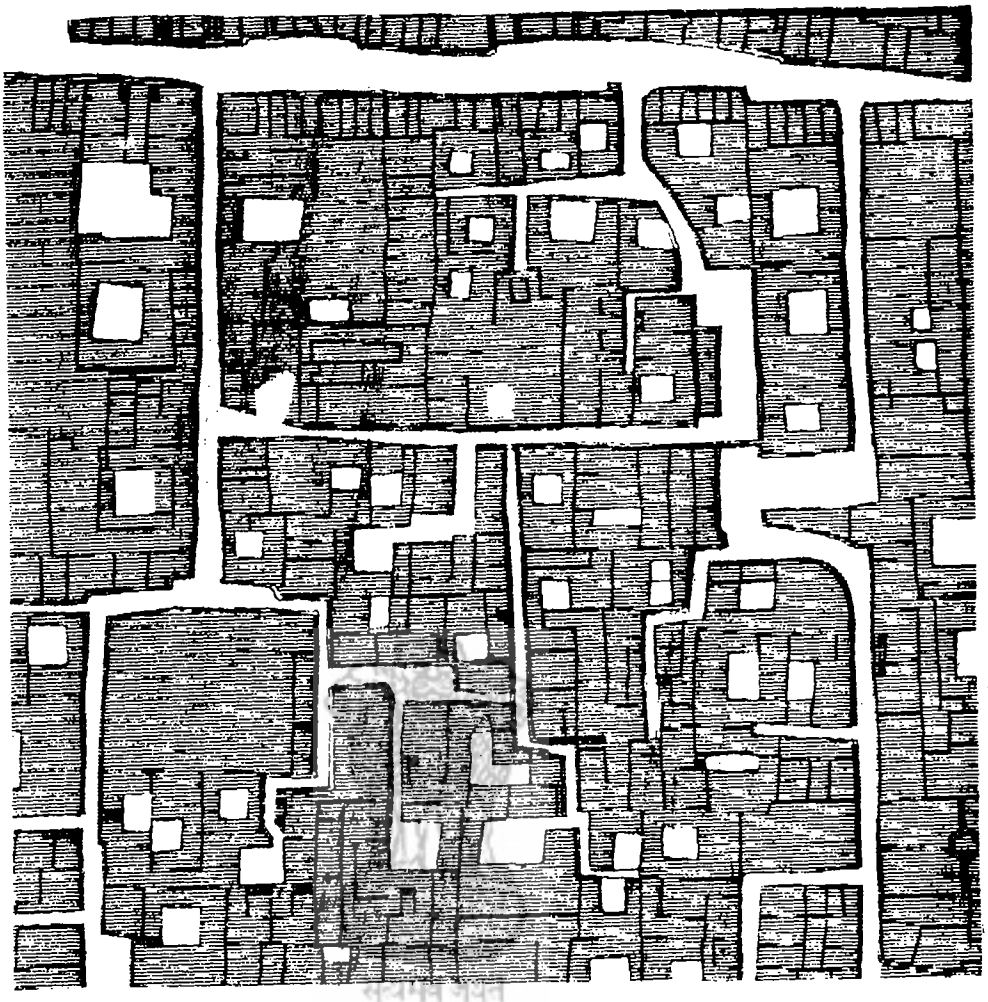
- identify the determinants of built form.
- analyse the relationship between built form and land uses, density, built-open space and visual aspects which are the indicators of built form, the socio-cultural factors in terms of activity space relationship and the market forces which influence intensity of built space utilization.
- compare various built form patterns using the above analysis.
- draw conclusions so as to identify the major considerations to be taken into account while prescribing a desirable habitat for the future.

3.2.2.1 **Traditional Built form pattern : Ballimaran.**—Ballimaran is a part of the walled city of Shahjahanabad built in the 16th century A.D. The form of this city was a direct emergence of the socio-cultural, religious, economic and political philosophy of that age. The predominance of the 'purdah' system, need for total privacy within the houses and security within a cluster, social and religious needs and the climatic constraints have all resulted in a built form pattern which has the houses arranged around a central courtyard with blank walls facing the streets and narrow shady circulation paths leading to a couple of shops, a temple or a mosque. This form provides the desired privacy, security and a degree of social intercourse that was required and just the right extent of complexity. The absence of any governmental regulations has allowed great flexibility in the organisation of spaces and structuring, thereby giving more freedom for the people to express themselves and establish identities. Communities were grouped on the basis of caste and occupation in the form of distinct residential units called 'Mohalla' separated from each other by walls and courtyards expressing social distance among groups (Rapport AMOS). The built form has evolved over a long time and is the result of various small changes/modifications/adaptions personalisation of individual dwelling without changing the main structure of the settlement. This is a form evolved out of socio-cultural consideration in a situation where market forces were very weak.

Although initially planned on the basis of mixed landless, the area is now invaded by commercial use and ground and first floors of most of the houses have changed to commercial uses especially along the main streets, in the form of Bazars. With the changed context of the city, the area virtually functions like central business district of Delhi. Intense market pressures have resulted into high densities, commercialisation & high land utilisation.

The area is marked by saturated high densities (1320 ppha) made possible by small dwelling sizes (average 20m^2), higher percentage of land under residential use (47%) higher coverage on the ground (67%) and acute deficiency of public open spaces, schools and health facilities (2.6%). The percentage of area under circulation is low (18%), the street is used for multiple activities and through movement of vehicles in the inner parts is restricted by the narrow winding cal-de-sac lanes.

The high percentage of commercial use (31%) caters to the needs of not only the city but also the northern region. Non-residential uses are fast replacing residential use and residential population have shown a declining trend. The high degree of mixing has brought along with it problems of traffic congestion, noxious and nuisance industries warehousing uses disturbing the residential area. The spatial organisation of Ballimaran depicts a continuum of built and open spaces in an irregular manner. Such an organisation encourages social use of space, establishes group identity and is a behavioural setting for cultural survival. In spite of the cultural erosion that is apparent, the inner precincts are still rich in the traditional culture. Semi-private open spaces in the form of courtyards are the only open spaces other than the circulation space which are intensively used.



Av. plot size	32.41 sq.m.
Av. D/ size	20.60 sq.m.
Cove: age	63.66%
Gross res.density	1313 ppha
Total land/person	4.38 sq.m.
Av. No. of floors	2

Residential	47.6%
Community facilities	2.6%
Commercial	31.5%
Open spaces	-
Circulation	18.3%
Total	100.0%

BUILT

OPEN

BALLIMARAN

Traditional area

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNIN[illegible]ND ARCHITECTURE NEW DELHI

The visual sequence in Ballimaran leads one along a series of aesthetic experience, the transitions between each being sudden and exciting, creating an element of surprise at every turn. While on the one hand the narrow gullies' lined with shops present a scene of intense color and activity, the inner 'mohallas' and courts speak out the culture and tradition of the area. All along, one finds the use of traditional architectural elements such as arched doorways, intricately carved window 'jalis' and repetitive motifs of balcony brackets.

In the ultimate analysis, one can observe that this kind of a built form pattern which was an emergence of the conditions that prevailed centuries ago may not have relevance for todays urban communities but is an excellent example where social organisation of communities has created a built form which is efficient in use and socially satisfying for individuals as well as groups. This was possible because of weak economic forces. The Socio-cultural aspects have been most ignored in the present day planning practices and regulations. The environmental deficiencies speak for the need for Public intervention and some degree of control.

3.2.2.2 **Organic Builtform Pattern—Urban Village : Piran Garhi.**—Piran Garhi is an urban village located in the west Delhi with a population of 2,686 (1991 census) and an area of 18.4 ha. It is essentially a Jat village, about three hundred years old, comprising of a traditional rural society. The builtform depicts the settlement pattern which is typical of northern Indian rural lifestyles. However, today the village has totally been engulfed by the urban development all around. The built form is compact and introvert with large internal courtyards. These settlements have not been effectively integrated into the development process and therefore are fast changing in response to strong market forces and heavy demand for commercial and industrial space. The absence of any effective governmental regulations has led the organic pattern to grow in a totally haphazard & distorted manner.

The residential use is predominant (60%). The land under commercial use which is 13.6% is actually the recent conversion of the residential plots into shops along major lanes and village periphery. The demand for commercial activity being very high, this transformation of the village has led to several environmental problems. Traffic has considerably increased. With the urbanisation of the village there are changes in occupation and activity patterns & lifestyles of resident households. Population and densities are rapidly increasing. The absense of open space in terms of parks and playgrounds is acutely felt. The area under social facilities which is around 10% of the total have been provided by the development authorities on peripheral lands. The area under circulation which is around 15% of the total area will not suffice with the increased volume of traffic.

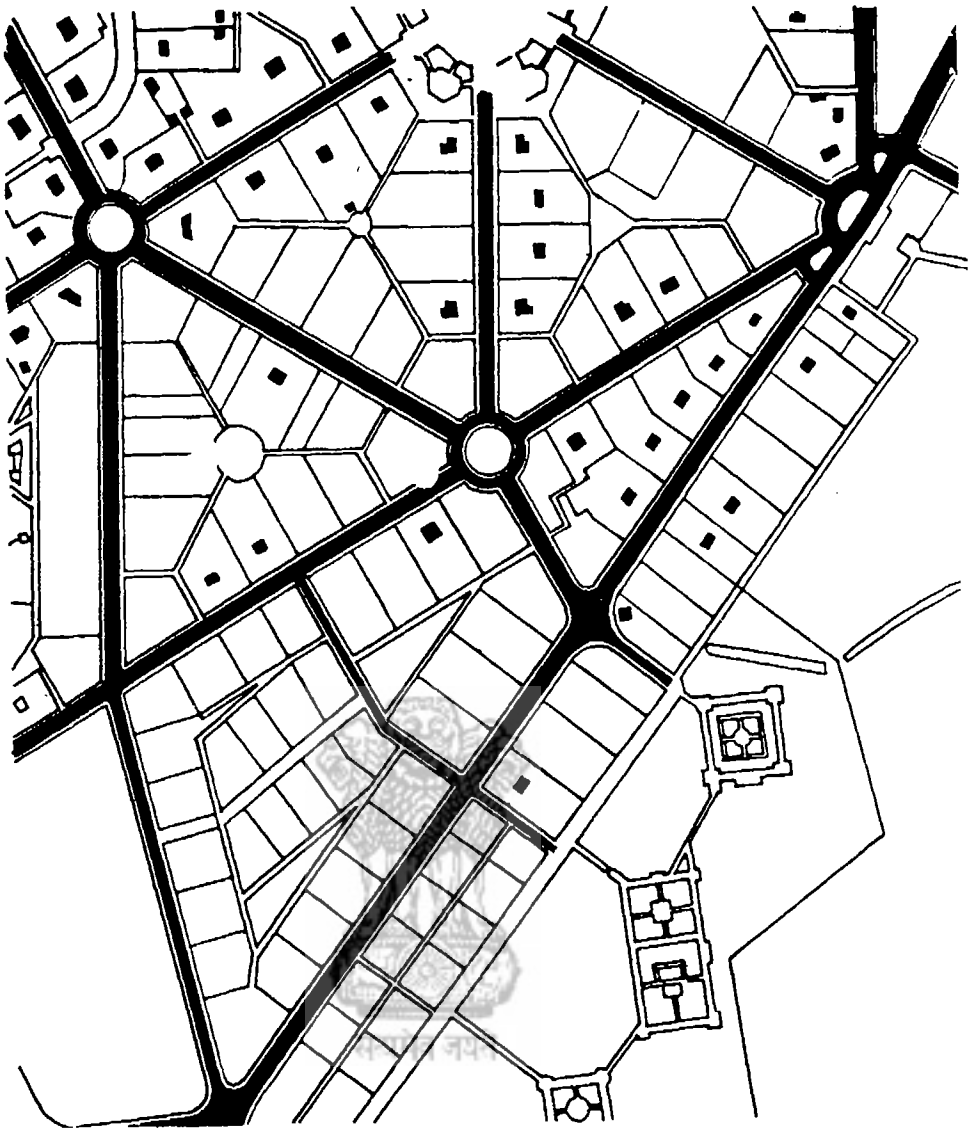
Even with the increase in density and continuous sub-division, the plots are not very small because original plots were very big. Noxious and nuisance industries are mushrooming and flourishing in these areas in absence of any regulations. Single room tenements with shared services are being constructed by plot owners to cater to high demand for low income rental housing in the city. The settlement pattern which was distinctly reflecting housing areas of different socially homogenous groups is fast getting transformed into a market commodity developed for heterogeneous tenant population. Land under built and open spaces is almost equal. The spatial organisation here is almost similar to that of Ballimaran but for the fact that whereas Ballimaran has evolved over time and still houses socially co-hensive community, urban villages are subjected to sudden market forces of change and therefore reflect distortions. Although the common spaces were designed for a high degree of social use and identity, today function of open spaces has changed so due to the invasion of commerce and industry into the village Private open spaces are disappearing and the internal courts are usually semi-private in nature.

3.2.2.3 **Colonial Bunglow Area—Lutyen's Delhi (Prithvi Raj Road).**—Lutyen's Delhi was a direct result of the political decision to change the capital of colonial India from Calcutta to Delhi. The built form was required to reflect the power and authority of British rule as a consequence of which have emerged huge bunglows majestically set in large grounds. These were designed to house senior British Officers and took into account their lifestyles and preferences and images. The overall concept was that of the garden city with wide tree lined avenues and large plots.

Most of the land is under residential plots (72.6%) and circulation (23%). There were no parks or playgrounds provided as the plots were very large and offered abundant private open space. Since the settlement catered to a very specific group of people, the use distribution is quite different from that of a typical residential area. There has been little change in land use in this area, largely due to the strong lobby to conserve character of imperial Delhi. However, there are several plots in this area where redevelopment and redensification was permitted and colonial structures were replaced by multi-storeyed apartments due to market forces. Detached bunglows with coverage as low as 15% depict a form which has been totally determined by factors like prestige, lifestyle, concept of privacy, amenity value. It has no relation to economics of development or planning regulations but reflect a colonial style.

Av. plot size	420.0sq.m.	Residential	60.0%
Av. DU size	273.0sq.m.	Community facilities	10.9%
Coverage	65.0%	Commercial	13.6%
Gross res. density	146.0ppha	Open spaces	-
Total land/person	68.5sq.m.	Circulation	15.5%
Av.no. of floors	1.0	Total	100.0%

	PIRAN GARHI Urban Village
	DETERMINANTS OF RESIDENTIAL BUILT FORM SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI



Av. plot size	10,000.0 sq.m.	Residential	77.0%
Av. DU size	500.0 sq.m.	Community facilities	-
Coverage	20.0%	Commercial	-
Gross res. density	15.0 ppha	Open spaces	-
Total land/person	644.7 sq.m.	Circulation	23.0%
Av. no. of floors	1.0	Total	100.0%

	LUTYEN'S DELHI
	DETERMINANTS OF RESIDENTIAL BUILT FORM
	SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI

The most important feature of this area is its extremely low density of 15 ppha and low density, meaning large plot size (0.4 Ha to 1 Ha) which was used as a device to express social distances. Also, this area assumes a quiet and peaceful atmosphere. Life in this area is therefore private and relations with outsiders are of a formal and secondary nature. It reflects the English rural ideal and could also describe the "ideal suburb" of today; free-standing houses in large grounds, plenty of space, self-contained areas keeping out "undesirable people", good transport to work and facilities which are kept distinct from housing. (Rappoport AMOS). Realising the pressure on this centrally located land, redensification in the form of multi-storeyed buildings on some plots have been selectively permitted.

This development pattern depicts an important aspect that when a household is provided with ample private open space, the need for public open spaces is minimal. Conversely in today's context when plots are very small and private open space is drastically reduced the provision of semi-private spaces, public parks and playgrounds becomes critical.

This pattern is also a great deviation from the traditional settlement in terms of the values attached to greenary and landscape elements. In fact, one of the most important factor contributing to the environmental quality of this development is the dominating landscape it has with treelined avenues and green lawns. This has significantly influenced the images.

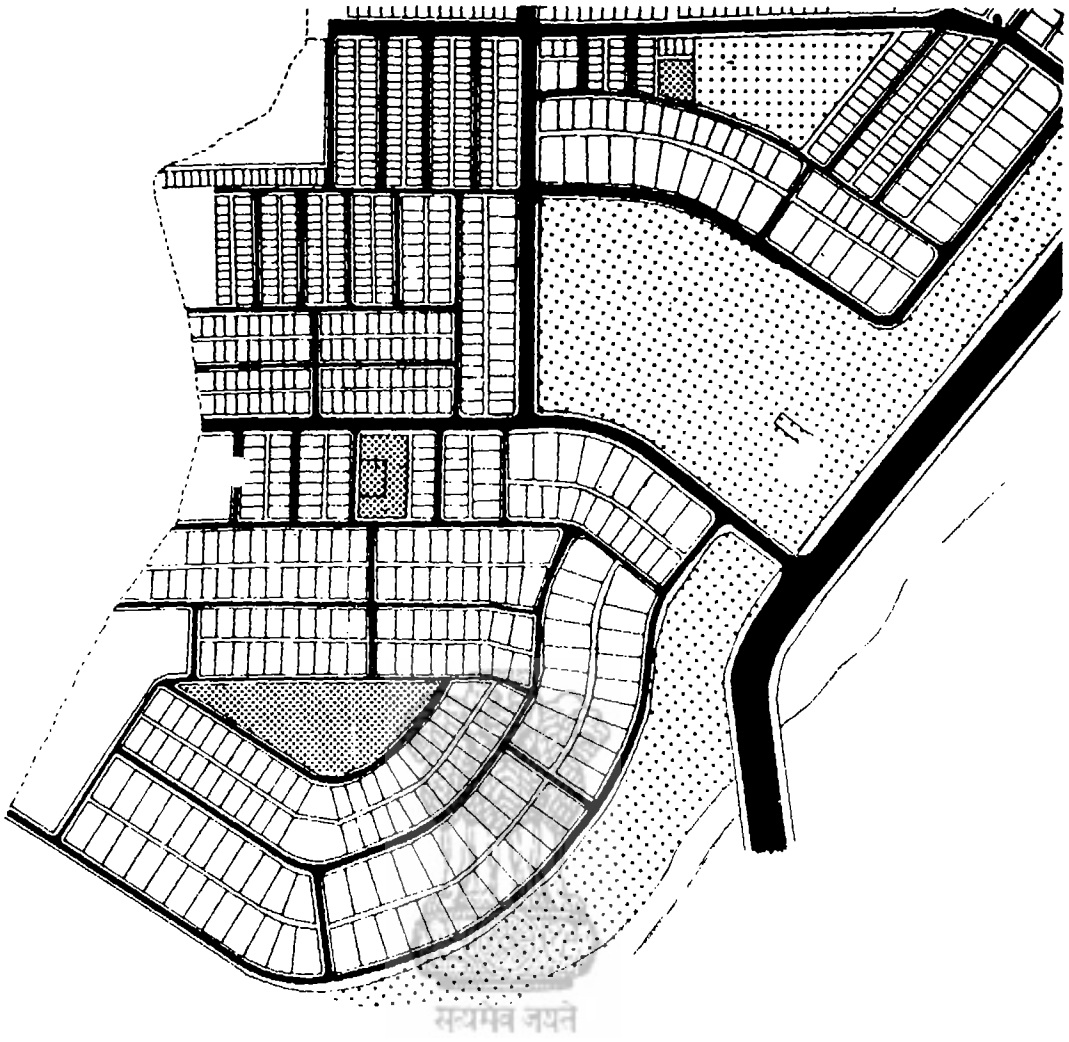
3.2.2.4 **Post Colonial Plotted Co-operative Housing : Punjabi Bagh.**—This area had its inception in the 1950's and was developed by a co-operative society. It is located in West Delhi and is one of the posh areas of the city. The land is sub-divided and developed by the society but the houses are constructed by individuals. This is a plotted development housing the upper income groups with large plots. Land prices in this area have risen tremendously in the last decade and today a square meter costs about Rs. 5,000. The community is homogenous in terms of preferences for built forms and economic status.

The area is provided with ample community facilities, parks and playgrounds and shopping (35%). The area under residential use is low (42.4%), whereas the area under circulation is high (22.6%). This is due to provision of wide roads and service lanes.

The gross residential density works out to 88 ppha which is a low density. The impact of the low density on the built form is that most of the houses are very big (500 to 600 sq.m.) with large plot sizes (1000 sq.m. average) with 60 per cent coverage. The detached houses provide abundant private space for occupants who use it occasionally as the private index is very high and most of the household activities are performed indoors, front lawns are thus more a symbol of status and prestige and privacy needs rather than any functional need for household activities. Open spaces are on the higher side at 70.25 per cent while the built space is at 29.75 per cent. The arrangement of houses along the two sides of long streets is a rigid spatial organisation. Here, one experiences open spaces predominantly at private and public levels. The area is not growing and population densities are more or less static. The growth is constrained by existing regulations which does not allow more number of storeys or multiple dwelling on each plot. There are number of such under-utilised areas which although face tremendous pressure of market forces but continue with the uneconomical use of land and goes against the principles of equity and social justice. Although individual houses reflect personalisation and individual choices, the layout is totally governed by regulation. Individuals have improved the environmental quality by landscaping and the area is quite colourful and rich. Since the houses are built by the people themselves, a variety of forms and textures are found.

3.2.2.5 **Unauthorised colony—plotted : Govindpuri.**—Govindpuri is an unauthorised colony in South Delhi. It was a result of illegal land sub-division by private developers. Delhi at present has more than 700 such colonies. It comprises an area of 44.25 ha and accommodates 22,865 people. It is a development which is neither in accordance with zoning and subdivision regulation nor follows building bye-laws. Public agencies have regularised some such colonies and are expected to regularise others in future. The regularisation does not alter the settlement pattern but only removes the stigma of illegality from these developments and entitles them for municipal services. Political patronage and the subsequent regularisation, has infact encouraged private colonisers to enter the market in big way. For many people specially the lower and middle income group today this is an easily accessible shelter option. The settlement pattern is unplanned or partially planned with more or less regular streets and back to back plots. There is a wide variety of plot sizes and these colonies cater to the needs of lower to middle income groups. Here again, as in the case of organic settlements, the absence of any government regulations has affected the built form negatively. Exploitation of the market demand is the sole concern of developer/promoter. The land use break up shows deficiency of community facilities and inefficient circulation pattern. Since the coloniser is interested in more sellable area, one finds that 70 per cent of the total land is under residential use. The area under open spaces is 8.5% which was left because the land was rocky and could not be sub-divided by the developer.

This is a high density area of 517 ppha. In spite of this density, plots are comparatively larger for individuals have grabed as



Av. plot size	1,030.0 sq.m.	Residential	42.4%
Av. DU size	645.0 sq.m.	Community facilities	10.6%
Coverage	62.7%	Commercial	1.2%
Gross res. density	88.0 ppha	Open spaces	23.2%
Total land/person	113.6 sq.m.	Circulation	22.6%
Av. no. of floors	2.0		
		Total	100.0%

RESIDENTIAL
OPEN
FACILITIES
CIRCULATION

PUNJABI BAGH

Planned development – DIT

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Av. plot size	26.0 sq.m.
Av. DU size	18.0 sq.m.
Coverage	70.0%
Gross res. density	517.0 ppha
Total land/person	19.4 sq.m.
Av. no. of floors	2.0

Residential	70.7%
Community facilities	-
Commercial	2.8%
Open spaces	8.5%
Circulation	18.0%
Total	100.0%

GOVINDPURI

Unauthorised colony

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI

much land as possible and the building abutting the road so as not to leave any chance of surrendering part of plot to public agency for road widening. When compared to Ballimaran, this density is very low, but the area is still growing rapidly (population has doubled in last decade) still one experiences the effects of overcrowding and lack of privacy due to one room tenements constructed by owner for rental purposes. On one house the plot occupancy was found to be as high as 40 persons. Thus, with the heterogeneous community and a density of around 500 ppha, social use of space does not take place and anonymity creeps in.

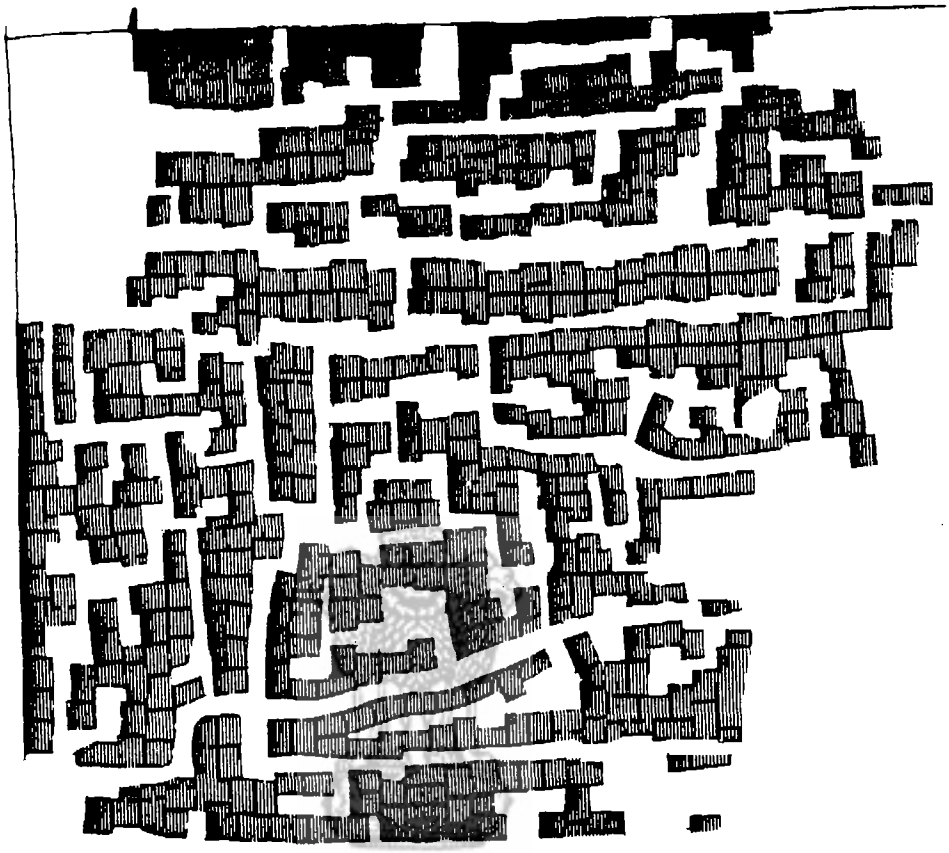
Plot sizes and plot proportions show vast variations from 500 sq. m. to 20 sq. m. the configuration of plots and networks is such that in many cases improvement of road, drainage and sewerage is not possible. Plot coverages are very high (70%) and buildings are one to two storeyed. Almost all the plots facing main circulation channels are commercialised and noxious and nuisance industries find space in such settlement and flourish due to absence of controls. Individual plot owners have freedom of building but the built form does not reflect household needs and house is used for generating incomes.

Uncontrolled, rapid growth of such settlements with heterogeneous community poses serious environmental and social threats. Wide spread incidence of such development is a cause for concern as these developments depend on surrounding residential area for social facilities. However, the community is quite united for their common interest of getting regularisation or development inputs from public agency.

3.2.2.6 **Organic Built Form Pattern—Squatter Settlement : Sanjay Camp.**—Sanjay Camp is a squatter settlement that has come up within a resettlement colony in South Delhi. This settlement, like any other in Delhi is a spontaneous outcome of housing needs of migrant urban poor. The form generated is a result of the natural propensity for formation of groups of families with strong social affinities such as caste, language and economic status and reflected in the form of distinct clusters. The people here are mostly the economically weaker sections whose affordability towards minimal shelter is very low. The pattern of the settlement is irregular as it is an organic growth which is not controlled by any regulations. The mud houses usually are arranged in several clusters grouped around a common open space which is intensively used for various activities and is subjected social control. Household activities spill over in this open space and houses are used only for storage. Pathways are also used for extended household activities and the area under these pathways and cluster level open spaces is about 20%. Very high portion of land is under residential use (80%) and the rest in circulation. The settlement thus comprises of only dwelling units and circulation paths and there is an absence of any commercial or social facilities uses. Market forces are absent because of insecurity of tenure and fear of eviction. Due to absence of market forces, one does not find any change of uses in terms of commercialisation as in other colonies. Thus, built form is predominantly residential in nature. Although there is a total absence of green open spaces, the circulation paths usually serve the purpose of child play coupled with several other uses. Thus the street becomes a place that caters to several spill over activities and is an integral part of the house. This kind of an integrated use affords a great degree of social intimacy.

This type of built form pattern has a very high density (3,500 ppha) with extremely small dwelling units sizes of 10 to 15 m^2 and absence of schools, parks. One can observe a dwelling unit and settlement pattern totally shaped by lifestyles and affordability of population. The shelter consolidation in terms of improvement in quality of material space and services is constrained by the insecure tenure. The material used for the structures is of temporary nature—thatch, mud, timber, etc. which are highly susceptible to catch fire. Many settlements have been razed to ground within hours as fire spreads quickly in these high density settlements. The very small sizes of huts and narrow pathways do not offer enough scope of improvement incrementally over years because of lack of space to expand horizontally. Huts cannot consolidate into two storeyed structures as they are too closely spaced. Although the community structure consists of socially homogeneous groups but the life-syles and values are rural in nature and are undergoing transformation with the urban exposure. Although market forces are not operative at present, these could become active in case the tenure rights are granted and improvement measures are taken up. Gradual gentrification, shelter consolidation & commercialisation has been observed in regularised/ improved squatter settlements in other cities.

3.2.2.7 **Row Housing—Plotted Development : Resettlement Colony : Madipur.**—This was developed in 1970 for resettling the squatter population. This colony has a population of 25,275 and covers an area of 24.22 ha. The people were allotted serviced plots of 21 sq. mt. as camping site at a very nominal rent and were allowed to construct the dwelling unit themselves. Very small plot sizes and shared services (community toilets and community taps) were provided to reduce cost of development. However, community facilities, roads and open



Sanjay Camp

Av. plot size	17.45sq.m.	Residential	81.4%
Av. DU size	12.91sq.m.	Community facilities	-
Coverage	74.0%	Commercial	-
Gross res. density	3747.0ppha	Open spaces	-
Total land/person	2.7sq.m.	Circulation	18.6%
Av. no. of floors	1.0	Total	100.0%

BUILT

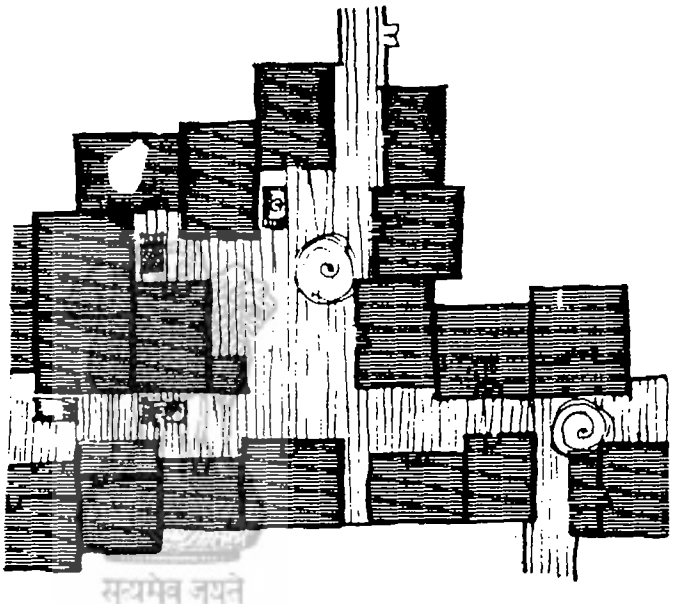
OPEN

SANJAY CAMP

Squatter Settlement

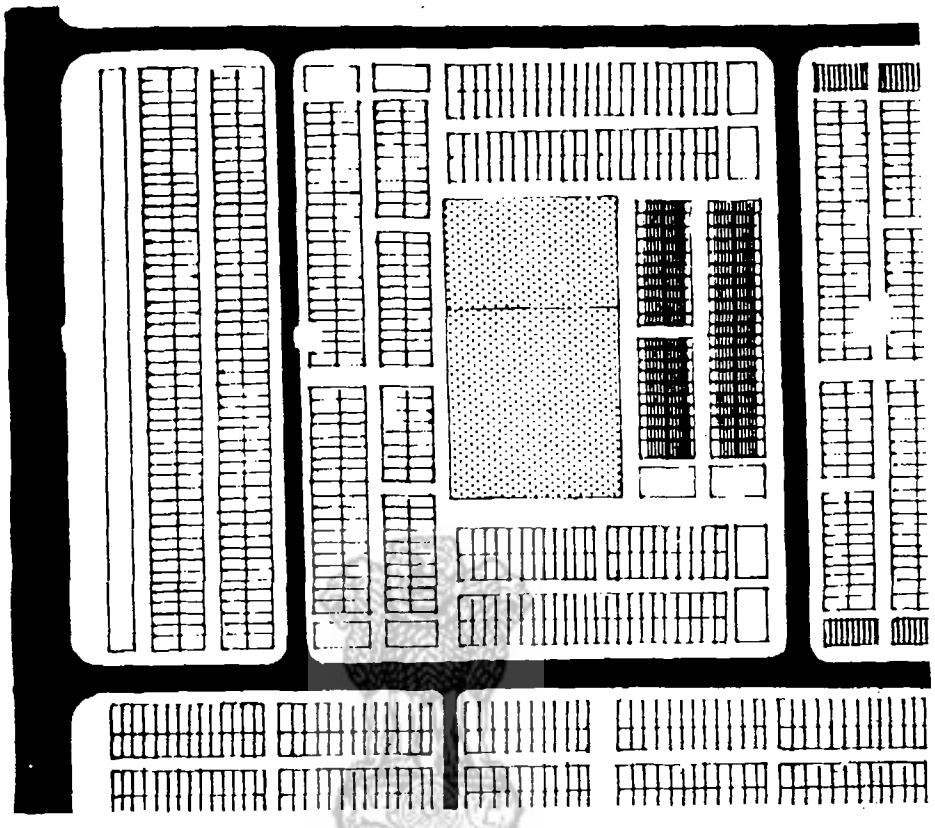
DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI



- semi-private open space is 2.5 to 3.0 sq.m/family
- the spatial organisation of huts is a manifestation of social grouping.
- the semi-private open space is intensively used for spillover household activities and child play.

	SANJAY CAMP Squatter settlement
	DETERMINANTS OF RESIDENTIAL BUILT FORM SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI



Av.plot size	21.0sq.m.	Residential	34.0%
Av.Du Size	18.9sq.m.	Community facilities	3.3%
Coverage	90.0%	Commercial	6.1%
Gross res. density	1043.0ppha	Open spaces	19.6%
Total land/person	9.6sq.m.	Circulation	37.0%
Av. no. of floors	2.0	Total	100.0%

OPEN

BUILT

FACILITIES

MADIPUR

Resettlement Colony – DDA

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI

spaces were provided as per the norms. Over the years due to the huge demand for these 21 sq. mt. plots many of the original allottees have sold their plots for a premium. Prevailing land prices are as high as Rs. 2,000/sq. M.

On account of extremely small plot sizes and standard road widths, the area under circulation is as high as 37%. Open space of 20% of total area has been provided in the form of parks and playgrounds. The area under plots comes to about 43%. This type of land use pattern in a high density — small plot size area with open spaces concentrated at a few places has generated a built form pattern which is neither economic in land utilization nor socially responsive to people's lifestyle. In absence of any effective regulation on the dwelling unit design, substantial number of houses have consolidated in the form of two and three storeyed structures incrementally over a period of time with 100% plot coverage. However due to extremely small size of plot (with one room and kitchen) it has not been possible to add individual bath and w. c. to each house. The community level toilets have become an environmental hazard due to poor maintenance and Public agency has to spend about Rs. 2 crore every month on maintenance of these services in 44 such colonies. The development has ultimately proved to be very uneconomical.

The area has grown in terms of population as well as floor space the densities have doubled over last decade. The area was originally planned for a density of 500 ppha. The present density of Madipur is 1043 ppha which is very high. It is thus a low rise high density development for low income households. The impact of such a density can be seen in the small plot sizes that could be achieved. It it only on the combined analysis of high densities with built and open spaces relationship that one can get an idea of the quality of the environment.

Commerce and small scale home based occupations have come up all along the main streets. This has contributed to generation of income for these low income families. This stresses the important link that exists between housing and income generating activities specially in case of low income families. The social organization of natural groups has been totally ignored and the spatial pattern is quite contrary to the lifestyles of people.

The large amount of public open spaces which comprises 56.5 per cent of the total mostly remains unused. All the activities right from child play to gathering of adults for conversations takes place in the street. The street is thus used as a community space and affords social intimacy. Space requirements for most of the activities are met within the confines of the street. The absence of a sequential clustering of built and open spaces has resulted in the redundancy of the huge open spaces provided.

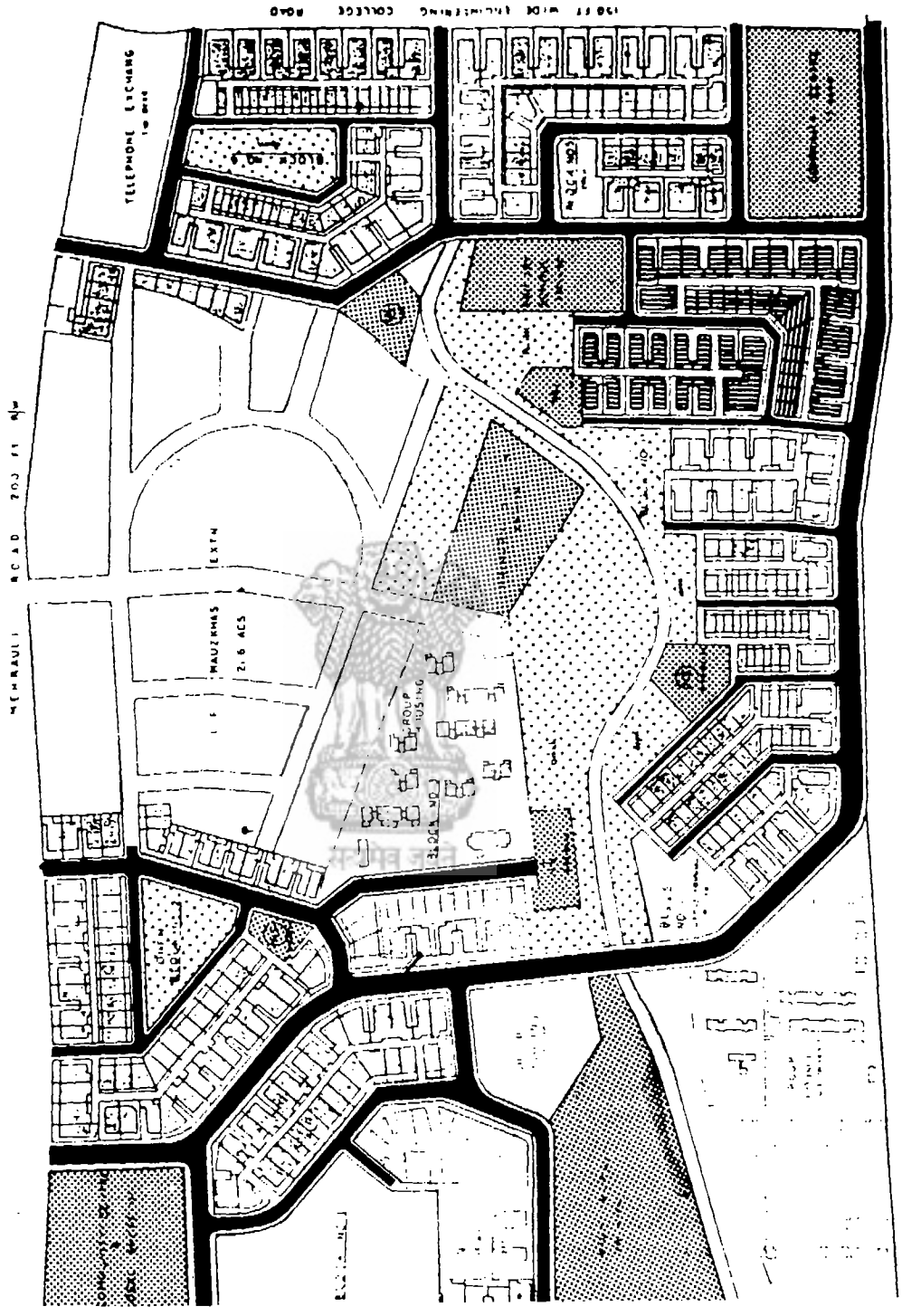
The spatial organisation is rather regimental with long rows of houses on either side of the street. Such as built to open space relationship has totally different effect on human behaviour than when there are clusters. Here, social inter-dependencies gets drastically reduced. The sense of a homogeneous community gets diluted and along with this the sense of security is also lost.

Visually, this type of built form offers little excitement. However, since the residents have the freedom to build their houses in the style they desire, one can observe a variety of physical forms in the rows of houses. Each house has a facade which reflects a different aspiration & values and thereby one can find a varied texture of built form.

3.2.2.8 **Planned plotted development by DDA : Safdarjung development area Block-C.**—This is one of the typical plotted developments of DDA wherein land was sub-divided and on the basis of prescribed Master Plan densities (150 ppha) generating semi-detached and row-housing plot sizes, ranging from 200 sq. m. to 750 sq. m. These large plot sizes had no consideration of affordability and were not planned for any target group. Therefore beneficiaries were selected by lottery and HIG plots were auctioned. The lavish space standards of plots at reasonable prices led to speculative tendency among the allottees and the development at present is housing very high income group. The very high income households have a higher privacy index and there is not much social interaction in space within the neighbourhood.

Although there is freedom to design individual's house within the building bye-laws, either the objective of socialisation of land is achieved nor intensive use of land has been made. About 25% of area is under roads. This indicates that low density to a very great extent influences both the utilisation of land and the target groups that get benefitted.

3.2.2.9 **High density planned development : plotted development by DDA Rohini Project.**— This is a high density (600 ppha) housing development developed by public agency housing all income groups with many deviations from Master Plan in term of density & plot sizes. This is an example to illustrate that it is possible to achieve higher densities in low rise planned development even by providing standard level of community facilities and open spaces. There are several achievements of this project which are contributing towards our general housing objectives.



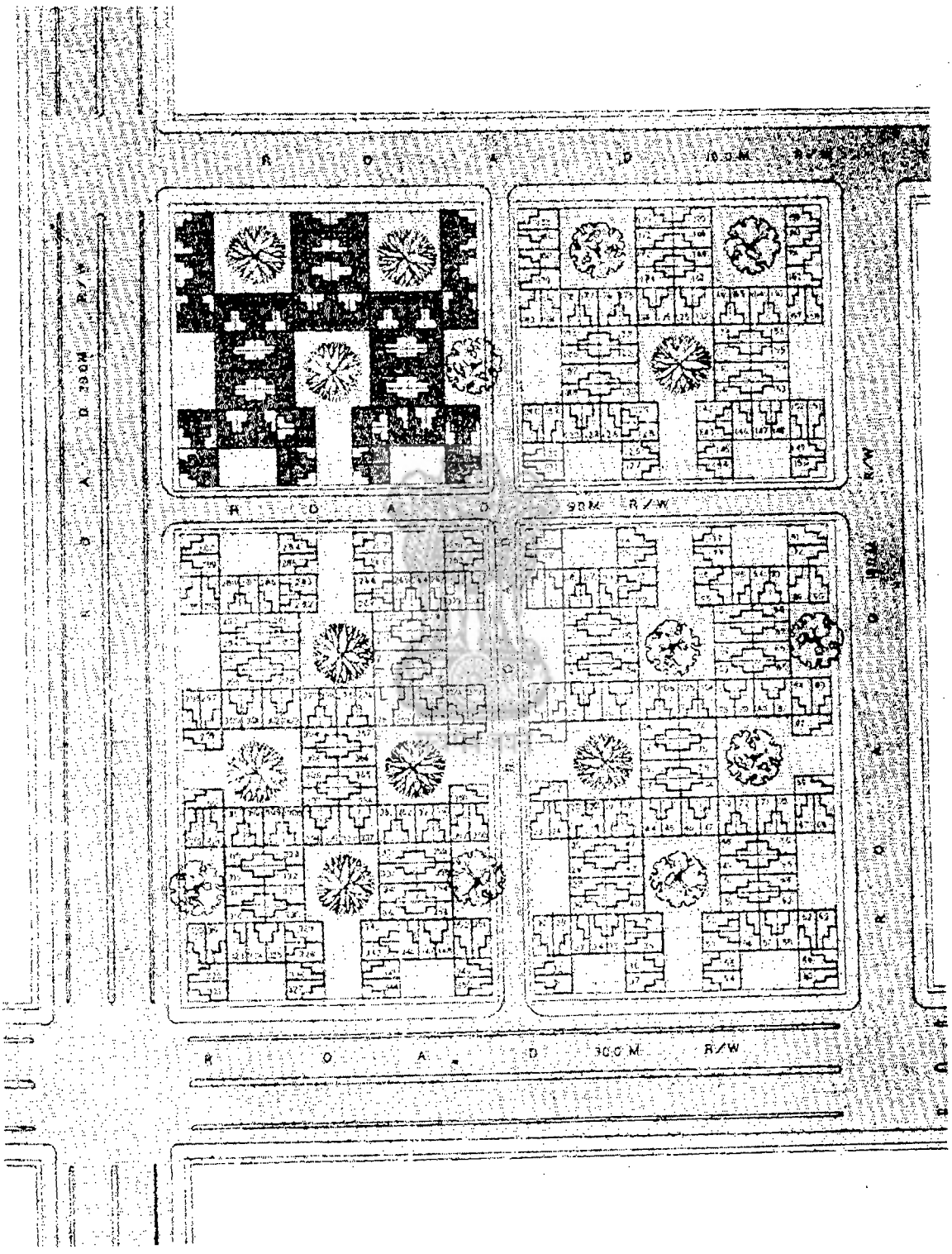
RESIDENTIAL
OPEN
FACILITIES
CIRCULATION

SAFDARJUNG DEV. AREA

Planned development - DDA

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI


ROAD
30.0 M. R/W
ROAD
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ROAD
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Housing for urban poor has been integrated with housing for middle and higher income housing thus removing the stigma of low income locality from this area. Housing for low income households has been provided in plotted development to enable individuals to establish, improve and add to their housing incrementally over a period of time according to their affordability and preferences. Housing standards have been worked out with consideration of affordability, need for indoor space and lifestyles specially of low income households. Space standards have been optimally reduced not only for low income group but also for high income groups. The smallest plot is 26m² and the largest plot is 150m² thereby reducing the gap between the rich and poor in terms of land that they own. Housing for middle and higher income groups is also provided in 4 storeyed group housing.

Whereas the layout of plots for middle and higher income group is in a row pattern, the plots for lower income groups is provided in the form of cluster around an open space to provide outdoor space for spill over activities of households. (Semi-private open space) in such a way that movement of people is not obstructed by spill over household activities. Even though each household has a cluster level open space in front of it, encroachment by individual households is not possible due to group control. The salable area has been increased (56%) by reduction in the circulation area (13.9%).

The smallest plot size of 26 sq.m. provides for accommodation consisting of one room, kitchen, bath, WC with a provision of one additional room on the first floor. This is a deviation from the resettlement colonies of 21 sq.m. plots, row-housing and shared facilities. The building regulations for these plots prescribe minimum size of rooms, bath, WC, heights of rooms and the coverage permissible on the plot. It has been possible to eliminate set backs due to the provision of cluster level open space.

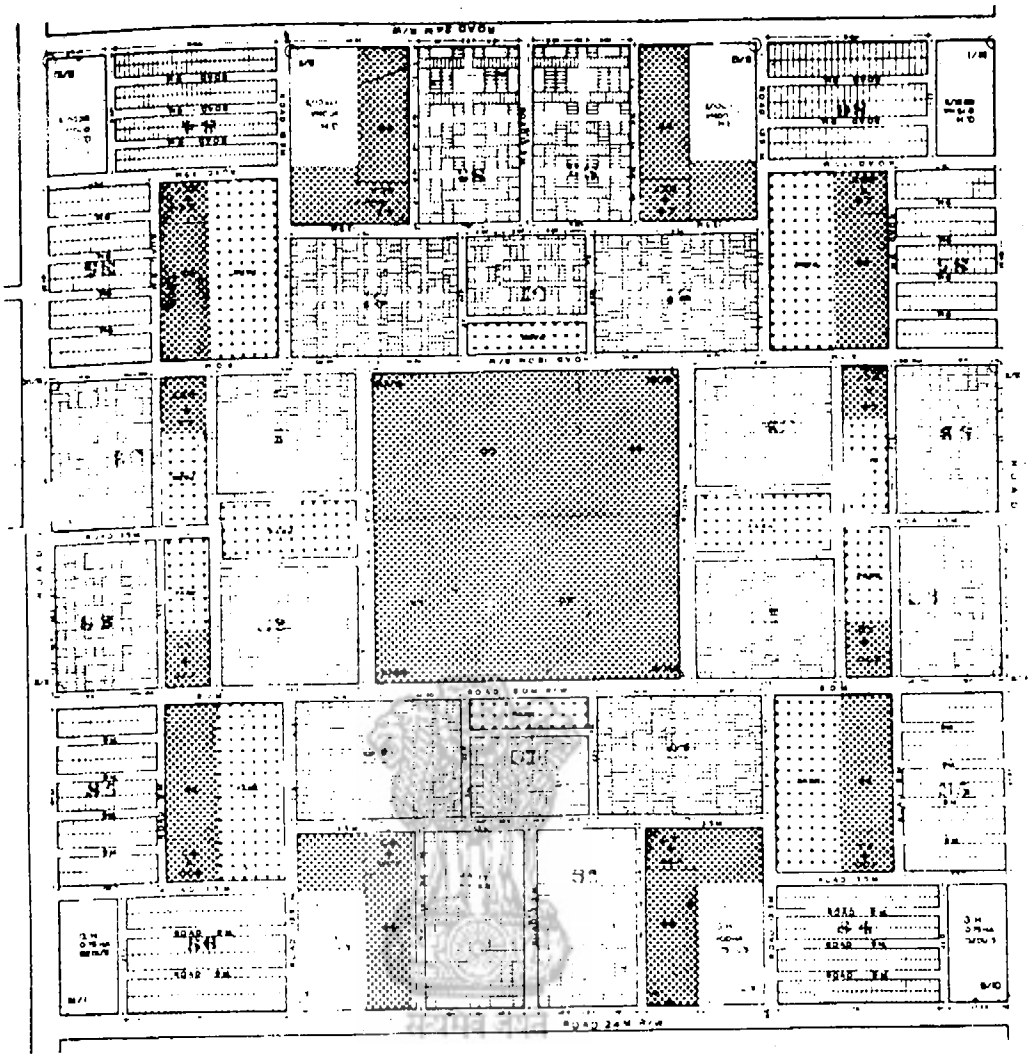
However due to the allotment systems of public agency although they belong to low income groups, community living in the cluster is not always socially homogeneous. Individual households get freedom to shape their dwelling design but the freedom to shape the cluster design is not there. This could have been possible if the cluster level land could have been allotted to the co-operative society formed voluntarily by small household groups.

3.2.2.10 **High density planned development—Co-operative Group Housing : Rohini.**—This is a part of the Rohini Project where about 215 ha. of residential area has been planned, subdivided and allotted to co-operative group housing societies and gross density of 540 ppha has been achieved. Community facilities and space systems were designed and a structure plan of the area was prepared and plots of 0.4 ha. to 1 ha. were allotted to co-operative societies at the norm of 50 d.u./ha (net). Each co-operative society has designed and developed dwelling clusters on their own within the framework of coverage, FAR and building envelope prescribed. The greatest advantage of such development is that socially homogeneous groups participate and design not only their individual dwellings but the immediate dwelling environment. This feeling of co-operation is very important tool in the form of common norms of behaviours and controls for use of space. Development and management of such developments has been most effective both in terms of quality and efficiency and overall housing satisfaction. Land utilisation is efficient because within their own area each group decides the use, multiple use of every space.

At overall level also the land utilisation is good as only 8.5% of land is under circulation (public land) giving access to each plot of land jointly owned by the cooperative. The internal circulation within the cluster becomes a semi-private space and can have multiple uses.

In Delhi mostly middle and higher income groups have benefitted from the co-operative movement therefore the dwelling sizes are 80m² to 120m². Thus generating a higher floor space. Almost all the co-operatives are four storeyed development with a few multi-storeyed blocks of high income housing. Although the densities in two storeyed plotted (low income housing) and this four storeyed co-operative housing are similar, the built form generated is absolutely different.

The only constraint in this co-operative development is that it is limited to group housing pattern only. Even plots could have been permitted on the each plots of land owned by the society, thus giving not only choice of shaping immediately environment but also freedom to choose development pattern and shape individual dwellings.



- Area of the sector = 100 ha
- Population = 60,000
- Gross residential density = 600 ppha
- Composite development of plotted and group housing for E.W.S., LIG, MIG & HIG
- Plot sizes - 26sq.m., 32sq.m., 48m², 60m², 90m², 90m² & 120m²
- Gross land/family=83.3sq.m.

DISTRIBUTION OF GROSS RES.AREA (100ha)	
Net res.area	38.2%
Facl. area	39.6%
Circulation	22.2%
Total	100.0%

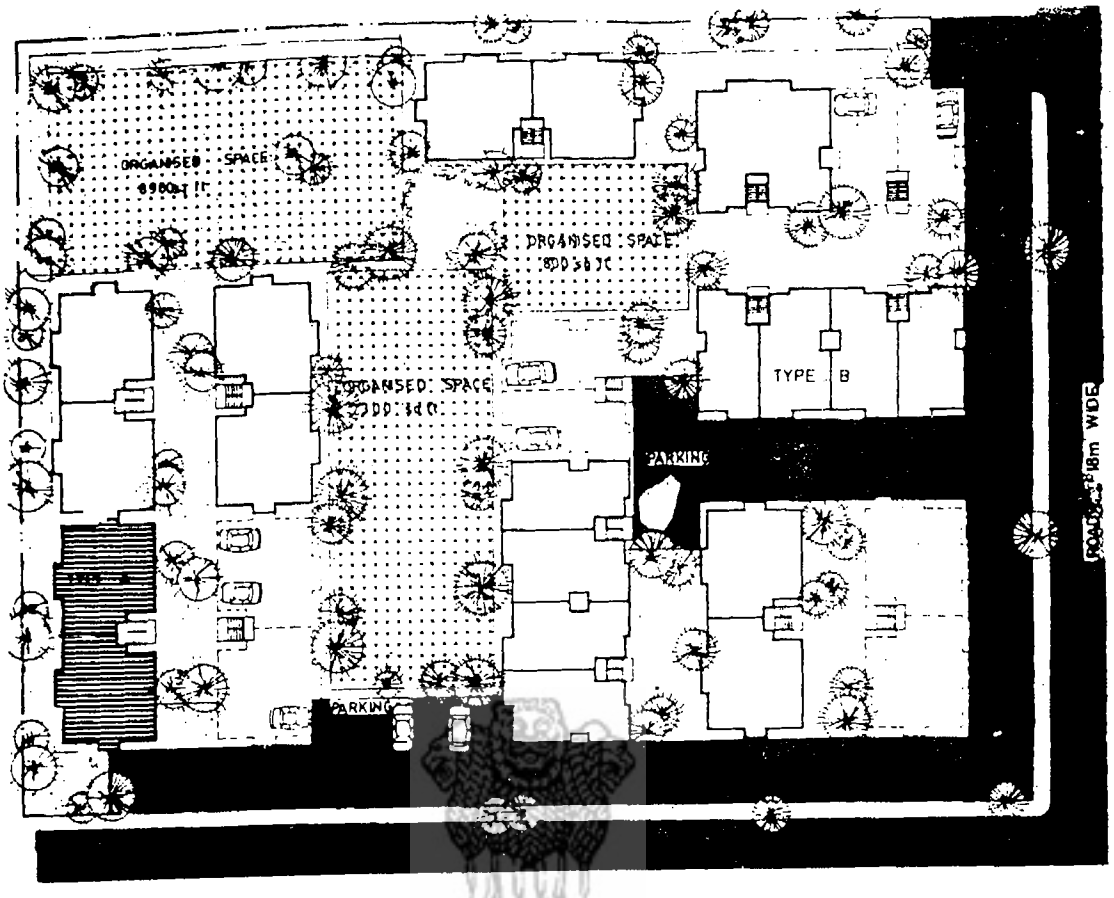
RESIDENTIAL
OPEN
FACILITIES
CIRCULATION

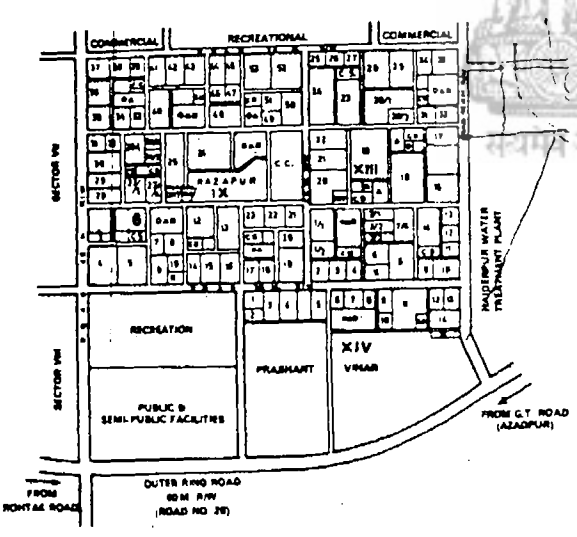
ROHINI SECTOR-3

Planned development - DDA

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI





Site area	- 0.69 ha
No. of DU's	- 104
Max. coverage	- 35%
Max. FAR	- 175
Max. height	- 80 feet
Max.D.U. size	- 2000 sq.ft.
Met density	- 50 d.u/acre+15%

PARKING

SIZE OF DU	CAR	SCOOTER
Upto 80sq.m.	@ 25% of total no. of DU's	@ 75%of total no. of DU's
80-120 sq.m.	@ 50% of total no. of DU's	@ 50% of total no. of DU's
above 100 sq.m.	100%	-

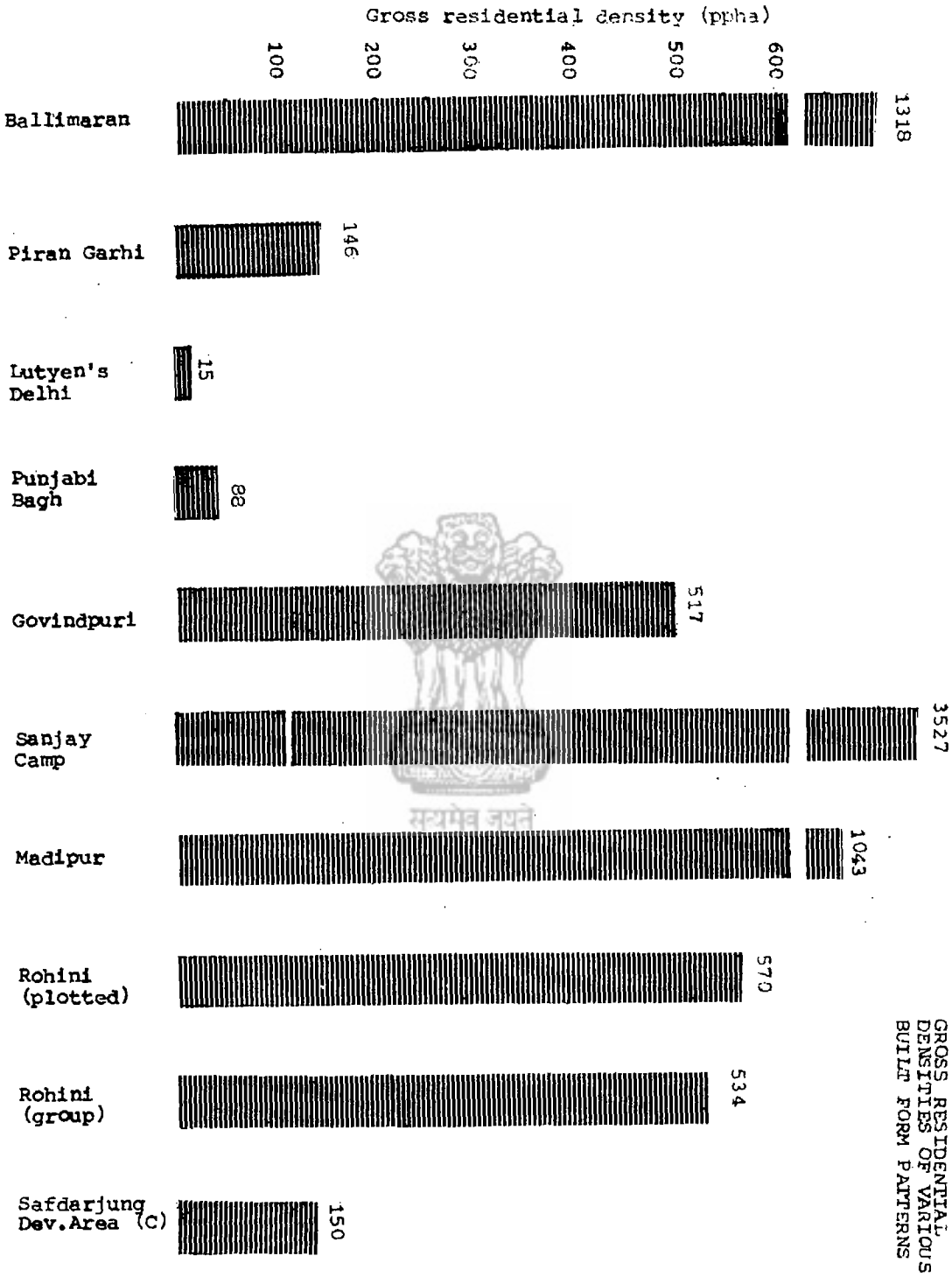
BUILT
OPEN
CIRCULATION

ROHINI

Co-operative group housing

DETERMINANTS OF RESIDENTIAL BUILT FORM

SCHOOL OF PLANNING AND ARCHITECTURE NEW DELHI



GROSS RESIDENTIAL DENSITIES OF VARIOUS BUILT FORM PATTERNS

Table No. (1-A)

OPEN AND BUILT SPACE DISTRIBUTION

		Ballimaran	Piran Garhi	Lutyen's Delhi	Punjabi Bagh	Govindpuri	Sanjay Camp	Madipur	Rohini (plotted)	Rohini (group)
Private	%	..		73·59	17·06	21·20	..	..	12·05	
Private	%									
Semi-Private	%	17·34	25·75	..	..	..	9·80	..	11·41	..
Semi-Public	%	10·42	7·64	..	7·44	..	..	..	12·37	24·20
Public	%	18·24	15·43	22·53	45·75	26·52	9·05	56·50	23·37	39·40
Sub-total	%	46·00	48·82	96·12	70·25	47·72	18·85	56·50	59·19	63·60
Private	%	30·26	47·87	3·88	25·32	49·84	81·14	40·0	35·80	30·00
Semi-private	%	..	..	..	1·24	..	..	..	..	..
Semi-public	%	23·74	3·31	..	2·69	2·80	..	..	4·90	6·40
Public	%	..	..	..	..	..	..	3·50	..	..
Sub-total	%	54·00	51·18	3·88	29·75	52·28	81·14	43·50	40·70	36·40
Total	%	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	1000·00
Open space/ Person	Sq.m.	2·01	33·47	620·00	80·25	9·24	0·50	5·42	10·38	11·90
Built space/ person	Sq.m.	2·37	35·03	25·00	33·99	10·11	2·165	4·16	7·14	6·81

Table No. (1-B)

GROSS RESIDENTIAL DENSITY, AREA AND LANDUSE DISTRIBUTION

		Ballimaran	Piran Garhi	Lutyen's Delhi	Punjabi Bagh	Govindpuri	Sanjay Camp	Madipur	Rohini (plotted)	Rohini (group)
Gross Res. Density	ppha	13.8	146	15	88	517	3527	1043	570	534
Gross Res. Area	ha	39	18.4	106	232	44.25	1.92	24.22	100	215.5
Area under Res.	%	37.6 47.6	54.7 60.0	72.6 77.0	65.0 42.4	37.6 70.7	37.6 81.4	37.6 34.02	37.6 55.88	37.6 69·3
Area Under Community Facilities	%	19.4 2.6	12.3 10.9	6.9 ..	8.65 10.6	19.3 ..	19.3 ..	19.3 ..	19.3 3.30	19.3 6.4
Area Under Commercial	%	1.6 31.5	1.0 13.6	0.5 ..	0.7 1.2	1.6 2.8	1.6 ..	1.6 6.11	1.6 3.09	1.6 5.7
Area Under Open Spaces	%	16.4 ..	10.0 ..	5.0 ..	7.0 23.2	16.4 8.5	16.4 ..	16.4 19.56	16.4 9.48	16.4 10.1
Area Under Circulation	%	25.0 18.3	22.0 15.5	15.0 23.0	18.0 22.6	25.0 18.0	25.0 18.85	25.0 37.0	25.0 13.9	25.0 .5
TOTAL	%	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0

Table No. (1-C)

PLOT DETAILS

		Balli-maran	Piran Garhi	Lutyens Delhi	Punjabi Bagh	Govindpuri	Sanjay Camp	Madipur	Rohini (plotted)	Rohini (group)
Av. Plot Size .	Sq.m.	32.41	420.00	10,00.00	1,030.00	26.00	17.45	21.00	26.0 to 120.0	
Av. DU Size .	Sq.m.	20.60	273.00	500.00	645.00	18.00	12.91	18.90		
Coverage .	%	63.66	65.00	20.00	62.70	70	73.98	90.0	75.0	35.0
Plot . . Proportion .	mxm		1 × 1.62	1 × 1.66				1 × 2.3	1×2 1×3	
Gross Res. Density . .	ppha	1.318	146	15	88	517		1,043	370	534
	HA/ha	218.6	97	3	15.4	89	624	180	114	103
	DU/ha	169.2	88	0.76	12	82	624	180	114	103
Saturated/ Growing	%	—2.16	+67.14	+22.13	+25.33	+132	..	+61.58		
Population		51,416	2,686	1,644	20,321	22,865	4,372	25,275	56 980	115,077
Total Land/ Person	Sq.m. person	4.38	68.5	644.7	113.63	19.35	2.66	9.58	17.55	18.7
No of Floors .		2	1.5	1.0	2	2	1	2	2	
Floor area .		108:100	60.5:100	3.87:100	36.5:100	98.9:100	75.96:100	76:100	84.58:1 00	

3.3 Inferences from case studies

Neighbourhoods and communities vary socially and economically, with different lifestyles within a city. There are obviously wide differences between the high income areas and the low income, slum and squatter areas. The differences are not due to economic factors alone. The level of social development varies greatly between those in high income areas and those in the low income or squatter areas depending upon the degree of social change from rural traditional way of life to urban way of life.

There is also differentiation between the existing builtup parts of the city, which are characterised by high densities of population, and congestion, as against new areas which have been newly developed, based on planning principles and embodying higher standards. These differences would obviously require different regulation framework and varying norms.

Though there are such wide variations among neighbourhoods within a city, yet standards for services, community facilities and social amenities are stated in general terms on normative basis without relating them to affordability and attainability.

However, in actual process of implementation, the uniform types of standards specified are rarely possible to achieve. For instance, the standards of services, water supply, sewerage, electricity, etc. are different in their application in squatter areas, slums and other low income areas, which are invariably much lower than adopted for middle income and high income areas. The reasons for this are quite obvious that the low economic capacities of these people and the conseqent limited resources of authorities do not enable provision of facilities at standards applicable to high and middle income areas. Therefore, while standards are not prescribed keeping in view variations between high income, middle income and low income areas, yet in actual practice differentiation does occur.

Recreational needs greatly vary between middle income and low income areas. The need for open spaces close to the houses are more pronounced in low income areas. Shopping facilities also vary as patterns of shopping behaviour are different. Hut shops, streets vending, mobile shops on wheels, open plat-form markets are characteristics of the shopping facilities in low income areas, whereas the shopping in the middle and high income areas would be more of formal type, incorporating buildings and facilities of much higher standards.

It is felt that although in the past, socio-cultural factors & climatic factors were strong determinants of built form, in the present context this has changed. Market forces operating within the context of city characteristics is becoming the single over-riding factor shaping the built form of cities. Urban space has assumed

the role of a valuable commodity in the market yielding high returns. This had led to distortions and socio cultural environmental considerations have been subdued under market pressures. Although market forces cannot be ignored a proper trade off between all these will have to be struck to achieve desired objectives of built form.

3.3.1 **Traditional areas**

(1) The built form is influenced by the population characteristics and housing market forces and is outside the regulations.

(2) The settlement pattern reflects aspirants and lifestyles of natural traditional groups. Each group is separated from other. The groups are not economic groups but social groups. The community has strong social groups in the area.

(3) The development provides ample freedom to shape dweling unit design and settlement pattern leading to the personalised and dynamic built form.

(4) The area has introvert planning with houses around the courtyard and narrow lanes. Thus the form is suitable to the local climate.

(5) The area houses large number of low income population.

(6) The area has saturated levels of densities (1314 ppha) with two to three storeyed development which have in fact started declining during the last decade.

(7) The high densities has been possible through :

high coverage of built up area in the ground;

very small size of average dwelling unit and high occupancy rate;

total absence of community facilities like schools, parks and playgrounds;

use of circulation area as an open space;

intensive use of internal courtyards (semi-private open space), restricting the vehicular movement on the periphery of the settlement;

negative effect of density is not felt by the residents because of socially homogeneous group and thus conflict and stress of high density is minimised.

(8) The area is subjected to commercial pressures and the residential use is getting replaced gradually by commercial and warehouses which is not serving the local needs. Thus the nuisance created due to higher degree of mixing, pressurising the space available and existing road systems.

(9) Individual behaviours are moderated by community norms and controls.

3.3.2 **Urban Villages**

(1) These are traditional rural settlements suddenly subjected to market forces and reflecting rapid transformations of settlement patterns & community structure.

(2) Although original residential patterns was determined by social factors but fast getting shaped by economic considerations. These transformations/distortions are happening in the following manner :—

high degree of land sub-division;

rapidly increasing built up areas, increasing coverage, increasing floor spaces and 2-3 storeyed developments;

single room tenements constructed for rental purposes cattering to low income housing needs;

rapidly increasing densities by addition of housing stock;

conversion of peripheral developments into commercial, warehousing and noxious and nuisance industrial uses.

(3) Deficiencies of community facilities, public open spaces. Private open courtyards are also gradually getting built up.

(4) Community structure fast changing to hetrogeneous nature with increasing tenants.

(5) Deficiency of services.

(6) Pedestrian pathways are not adequate nor appropriate for increasing number two wheelers and four wheelers traffic.

(7) The freedom to shape dwelling design is basically used by people to respond to market demand and not to user needs.

(8) The original settlement pattern was introvert and responsive to climatic factors but transformation have no relation to traditional styles, local material construction technology or climatic determinants.

3.3.3 **Squatter Settlements**

(1) Squatter settlements are basically a result of the housing needs of the urban poor with very low affordability. The land is illegally encroached by migrating low income households. The built form reflects both the insecurity of tenure as well as rural lifestyles manifesting an urban setting.

(2) The community pattern consists of several homogeneous social groups. The housing form takes shape in small district housing clusters.

(3) The houses are basically constructed by the users but the freedom to build is constrained by low affordability and fear of demolition.

(4) The houses are very small and the household activities extend out in the cluster level open area in front of the house. Thus, this open space become a nuclear around which individual houses are structured. The settlement is rich in these semi-private level open space which form the "cultural core" of such development. Multiple and intensive use of this open space is made by the group reflecting very low level of privacy. The conflict is minimum as the socially homogeneous group observes common norms of social behaviour and controls.

(5) The circulation paths are used not only for movement but for household activities too. There is an overlap of both these activities.

(6) The areas are marked by very high densities and single storeyed structures. This is possible because of very small size of the dwelling unit (10 sq.m. approximately) very narrow pathways and total absence of public open spaces and community facilities.

(7) These areas have acute deficiencies in terms of service networks.

(8) The non-residential uses in the form of home based economic enterprises have strong linkages with these housing areas and form an integral part of the settlement structure.

(9) The structures being temporary, are highly vulnerable to hazards like fire and do not provide protection for rain or temperature.

3.3.4 **Resettlement Colonies**

(1) These colonies represent an effort to resettle squatter communities in straight jacketed form totally dictated by rigid planning norms.

(2) On account of security of tenure, shelter consolidation is significant. Dwelling unit forms are totally shaped by individual efforts, reflecting propensity to invest and individual choices. The settlement form has absolutely no reference to the lifestyle of the people and does not since due regard to the natural groups.

(3) Cluster level open spaces are replaced by large public parks which remains totally unutilised whereas the narrow access-ways are intensively utilised for extended household activities.

(4) The densities are rapidly increasing and the plots get intensively built to the extent of three storeyed on 21 sq.m. plots.

(5) The total disregard for basic requirements of proper light and ventilation is due to very small plot sizes, 100% coverage and absence of regulations/enforcement for the building bulk.

(6) Although initially planned for high densities (500 ppha), further increase strains the existing facilities and services.

(7) It is an example which proves that community services, and facilities (community toilets, etc.) although provide to economise on development cost have proved to be highly expensive due to very high maintenance costs. (DDA spends around one crore rupees a month on the maintenance of these colonies). There is little possibility to improve these upto dwelling unit level.

(8) This is also a bad example of total economic seggregation of communities and a large concentration of low income population which is socially detrimental.

(9) The circulation area here is very high and reflects a very wasteful layout design.

(10) There is a very high percentage of commercialisation along the major movement corridors. This has led to soaring land prices (Rs. 1,000 per sq.m.).

(11) With secure tenure land prices have increased.

3.3.5 **Unauthorised Colonies**

(1) These are settlements resulting from illegal sale and sub-division of land by private colonisers/owners. The settlement process greatly affects the built form.

(2) The profit maximising motive of developers is reflected in the total absence of facilities, and public open spaces.

(3) Increasing invasion by commercial and industrial uses act detrimentally towards worsening the environment.

(4) The built form is very dynamic and changes due to continued subdivisions, increasing coverages and increasing floor space.

(5) The community structure consists of very hetrogeneous community.

(6) This kind of built form provides rental housing stock to many low income households

(7) The settlement pattern is so irregular that provision of services and improvement of road network is difficult.

(8) This is the fastest growing housing subsystem in Delhi occupying the urban periphery.

(9) This development indicates the need to involve private sector in the development process.

3.3.6 **Lutyen's Delhi**

This colonial form of development has no relevance to present socio-economic context and levels of urbanisation. The one single attribute it depicts is that trees and landscape can very greatly reduce the sterility of high density concrete jungles and modify the micro-climate to reduce the heat of harsh summers, that are so typical of hot and dry climate of Delhi.

3.3.7 **Planned developments (plotted development)**

(1) Obsessed with providing good residential environment, most of the planned developments have wastefully utilised the land with low rise low density development. These areas indicate the need to reduce maximum plot sizes so that higher densities can be achieved and more number of families can be housed in the same amount of land to achieve equitable distribution of the basic limited resource of 'land'.

(2) While there is a need to intensify the use of residential land, norms for the community facilities also need to be rationalised and made intensive use of.

(3) While accessibility to houses is important the provision of roads should be need based, there is a need to minimise areas under circulation by layout optimisation.

(4) Front and side set-backs which create the western type of extrovert form do not appear to serve any purpose except providing light and ventilation only. Specially with smaller plots, such set-backs do not either provide enough distance for privacy nor the space is sufficient for outdoor household activities.

(5) These planned developments are also subjected to market forces and have violated the regulations by change of use/extent of built space. The enforcement of regulations is ineffective.

(6) Group housing development for low income households is most unsuitable because it is possible to achieve higher densities in plotted development.

3.3.8 **High density planned development: (Rohini Project)**

(1) The achievements and weaknesses of the project need to be consolidated and used as a feedback into the strategies governing the residential developments. Possibilities of making the regulations more open ended and more people friendly can be explored through such experiences.

(2) The need to streamline and simplify procedures for speedy sanctioning is most essential if larger number of low income households are expected to build in accordance with the laid down development regulations.

(3) Co-operative societies can be considered as social group which has been formally recognised and institutionalised. The group can be formed on the basis of various "common interests" and creates an important link and intermediary between government and individual households specially in case of low income households to facilitate development supports and management.

CHAPTER 4

GUIDELINES FOR DEVELOPMENT REGULATIONS

4.1. Scope & limitations of Development Regulations

Before specific recommendations are made for development regulations it is essential to state that although these can influence the spatial structure of residential area in cities, it has limited role in improving housing situations as such. It can not alter the organisation of housing production processes, control market prices, achieve better distribution of housing resources or ensure delivery of basic services amenities. Public interventions through various other instruments of urban land policy have to be used to effect more fundamental change in the organisation of housing supply. Housing at present is being traded and speculated upon in real property market as safe investment in the inflationary trends. Hoarding on properties also leads to long term accumulation of wealth. This is also closely linked with the trends in money market and generation of black money. The increase in land prices has been greater than general increase in prices. Today most of the low income families are excluded from the housing market because of the high price of land and properties. These market forces are shaping the built form in cities.

In such a situation, where peoples' basic necessities are being exploited by market forces, the role of the private sector needs to be more explicitly defined and regulated. If housing is recognised as a fundamental right and social obligation of the state then the present scenario of land and housing supply has to be drastically altered. Housing is not like other consumer products but is a basic necessity and therefore can not be left to market forces. The state and legislature would have to assume greater responsibility and concern itself with achieving more equitable distribution of land and housing stock by effectively regulating the private market. A separate study needs to be initiated to examine the possible policy options and suggest suitable instruments of land policy.

4.2 Standards for minimum livability

Present market forces have created developments of "affordable livability" (slums and overcrowded, squatter areas). However, in our opinion market price and affordability should not form the basis for deciding minimum levels of livability. There has to be trade off between affordable housing and minimum desirable levels of livability. Although economic considerations are important in a situation of scarcity of resources, minimum standards of livability in terms of living space, facilities and services should not be sacrificed. This requires setting of minimum standards which every family can aspire to achieve if not immediately, but incrementally over a period of time. The option for future incremental improvement of space and services should not be closed for any economic considerations.

Housing standards need to be formulated with considerations of affordability, life-styles, climatic factors, land and development costs and technological options. These factors vary from city to city within different climatic regions, varying housing markets and households incomes. It is therefore not desirable to prescribe uniform standards for all municipal agencies in different parts of the country. Specific standards should be formulated within broad policy framework for a specific city. Although the broad parameters for formulation of standards have been recommended in this study, it is felt that prescription of specific appropriate norms for specific city can be worked out separately.

4.3 Enforcement of Development Regulations

To be effective, whatever minimum controls are proposed should be enforced. The provisions of building regulations need to be simple and easily understood by common man. Public attitudes towards development controls must change whereby individual intersts are compromised in the larger interest of community. Simplified system of approvals and regulations needs to be supported by effective legislation, efficient decentralised institutional framework and fiscal measures not only to control development but also promote development as per development strategy of the city. Severe penalties for non-compliance of proposed regulations should be imposed.

4.4 Regulations for existing built-up areas

Different sets of regulations are required for development of new areas for urban expansion and improvement/renewal of existing built up areas. Whereas desired level of environmental standards can be achieved for new areas, enforcement of standards in existing built up areas is greatly constrained by various factors like :—

(i) Legal status of developments (squatter settlements or illegal land sub division of land), land ownership and tenure of occupants.

(ii) Legal tools available with public agency to intervene for improvement or renewal e.g. the development plan, Slum Improvement Act, Repair and Reconstruction Act, tenure regularisation etc.

(iii) In a densely built area the layout may constrain widening of lanes, provision of services and reconstitution of properties without substantial dislocation and clearance. Provision of services will also depend on availability of off-site infrastructure and threshold of infrastructure capacities. Provision of facilities (open spaces, schools etc.) usually gets compromised with availability of vacant plots and possibility of acquiring properties for facilities.

(iv) The motivation of the resident community and co-operation of local politicians is critical for any renewal/improvement project.

(v) Each built up area with acute problems may require special set of regulation after considering nature of existing problems and possibility of improvement—e.g. problems of inner city area are quite different than those of squatter settlements. Development potential of each area will differ on the basis of location and opportunity offered by location in that city.

(vi) Financial supports through taxation/grants are necessary to improve existing built up area. At present however there is no effective financial mechanism to generate resources for improvement of existig built up areas.

Prescription of uniform development regulations for renewal/improvement of all existing built up areas is not advisable and local agency should have the flexibility to work out detailed improvement proposals for specific built up areas which are enforceable.

4.5 Regulations for underutilised areas

There are certain built up areas within each city which are underutilized. These are low density developments with large plots where the permissible FAR is not utilised. Regulations to promote redensification of such areas is necessary to achieve intensive utilisation of land. Redensification can be promoted by :—

(i) Permission of higher density/FAR/plot.

(ii) Augmentation of infrastructure to support higher density.

(iii) Legislative measures like the Apartment Act facilitates utilisation of higher FAR of large properties by construction of apartments and allowing sale of undivided share of property to apartment owners. Many cities in Maharashtra are getting densified under the provisions of the Apartment Act.

(vi) Properties be taxed if permitted FAR is not utilized within a span of say 10 to 15 years.

(v) High taxation for vacant plots.

4.6 Development Regulations for new areas

4.6.1 Organisation of Residential areas

Since the built form reflects a wide variety of economic and cultural characters of various groups, some of the values and aspirations may be quite conflicting and contrary to each other. (Recent rural migrants and urban industrial workers). Framing a common design guidelines for different group-needs and varying activity space relationship, is very difficult. At city level, these groups are quite heterogeneous. An overstructured, over specified residential setting can be inhibiting human behaviour and create stress for a changing lifestyles over a period of time (Rappaport Amos). The common shared facilities which are essential to ensure minimum acceptable levels of livability needs to be identified and prescribed allowing more flexibility and freedom at micro level. Moreover since strict enforcement of regulations is not probable in foreseeable future, reducing the extent of conntrol is the only way to prevent a totally haphazard development. The question is rather what is the least that needs to be prescribed and fixed to achieve desired objectives. It is felt that provision of community and minimum living space for each family are critical factors which needs to be prescribed and enforced through development regulations. At property level greater freedom and flexibility could be given to individuals and small social groups to adapt and shape micro environment to suit their choices. A system where controls are minimum at plot level is not only desirable but feasible. (In Jaipur, building plans for plots upto 400 sq. yd. area are only scrutinised for the specified set backs and building envelopes. Physical organisation of residential areas therefore should be on the basis of hierarchy of community facilities.

4.6.2 Community facilities

The following table identifies some of the essential facilities, area required and supporting population for each facility.

Subdivision regulations of municipalities should provide for allocation of land for community facilities. These facilities are considered essential in view of the human resources development policies of our government. Provision of these non-remunerative uses has to be ensured by public agencies and cost charged to the saleable residential area. Since provision of facilities is population based, it does not vary with change in residential density. Although the quantum of open space is prescribed the nature and use of open space could vary with

different climatic conditions, income groups and with changing lifestyle.

4.6.3 **Building Regulations**

Building regulations for new development could be classified into two categories.

(i) Houses on plots below 100 sq.m.

(ii) Plots above 100 m².

The degree of controls for smaller plots could be minimal and for multistoreyed buildings could be maximum to meet various requirements of light, ventilation, structural soundness, fire safety, other requirements of services, parking etc..

TABLE 2

COMMUNITY FACILITIES

Essential Community Facility	Approx. area		Supporting population	
1. **Open Spaces :**				
(i) tot lots	400	sq.m.	250	(50 families)
(ii) Playground (small football ground)	5000	sq.m.	5000	(1000 families)
(iii) Park	15000	sq.m.	15000	(3000 families)
Open space provision at all levels	18	sq.m./family		
2. **Educational facilities :**				
(i) Primary school (considering 100% enrolment for primary education and 600 students per school)	4000	sq.m.	5000	(1000 families)
(ii) High School (considering 75% enrolment and 1200 students/school)	16000	sq.m.	10000	(2000 families)
	12	sq.m./family		
(iii) Other facilities :				
like Dispensary, Post Office, Police post and Community Hall religious buildings, Elect. sub-station, fire fighting	3500	sq.m.	5000	(1000 families)
	3·5	sq.m./family		
TOTAL :	33·5	sq.m./family		

TABLE 3

BUILDING REGULATIONS

Building category	Building controls
(i) plots upto 100m²	minimum plot size of 26m² plot coverages upto 75% minimum size of ventilation courtyard of 2 M ×2·4 M number of floors –2 no basement if structures are of temporary material, fire resistant material be used provision of individual toilet be ensured minimum space standards guidelines for users (regarding room sizes, kitchen, w.c. sizes)
(ii) Plots above 100 m² 4 storeyed group housing and multistoreyed developments	building regulations as per national building code.

4.6.4 **Dwelling Unit—space standard**

Considerations of climate, material, infrastructure and affordability are important to decide dwelling space. At a minimum level of decency, a household should ultimately be able to have one room, a small kitchen, individual bath and WC. These require built up space of about 20m². Incrementality is possible in a plotted development in which case, with 75% per cent coverage, a plot of 26m² is required. This house has a potential to grow vertically and one room can be added for use of family or for subletting, thereby housing two dwelling per plot. It is recommended that in no case the plot size should be reduced below 26m² in the name of affordable sizes. Where land prices permit, a plot of 40m² be provided to allow a horizontal growth of addition of room.

Equity needs to be achieved in the distribution of the most important housing resource of land. Instead of trying to achieve economy through reduction of plot sizes for the poorest households only, greater overall economy in terms of land

requirement can be achieved by reducing maximum plot sizes. The tendency to have more land than one can effectively build upon needs to be curbed.

For an average family of five members, 150 m^2 of built up space provides sufficient accommodation for luxurious living (living-dining, 4 bed room, study, toilet, kitchen). A plot size of 250 m^2 with 66 per cent coverage will be able to provide this on ground floor. It is, therefore, recommended that the maximum plot size should not be more than 250 m^2 which provides for two dwelling units on two floors with 1.2 FAR. (additional 0.5 FAR on second floor can also be considered for 3rd dwelling unit.)

Smaller plots upto 50 m^2 should be provided with immediate semiprivate open space in the form of a cluster level open space to act as a community courtyard for overspill household activities. (refer study of squatter settlement). This space is critical and can to some extent compensate for the meagre indoor space. About 6 to 12 plots can be grouped around the open space giving on an average of about 6 m^2 of semi-private space per plot. Mixing of non-residential uses in housing areas needs to be channelised by anticipating and properly articulating them in the spatial pattern of road networks (the location in relation to road hierarchy is vital for any retail outlet to function).

4.6.5 **Plot coverages and FAR**

On individual plots (for plotted development) the coverages to be specified 66 per cent for 250 sq. m. plots and 75 per cent on plots upto 100 sq. m. There is no need to specify setbacks from the property lines as long as each living room has external light. However on a particular street, building lines should be uniform to have harmony in street picture. However, no part of the building should project outside the property and no violation should be compoundable.

These coverages with two floors give a floor space index of 1.2 to 1.4 Private open spaces within the plot in the form of courtyards should not be smaller than 2 m $\times$ 2.4 m to allow serviceability and light to adjoining rooms. In all the plotted development only two floors are proposed because densification and the services remain under-utilized for a longer period in three storeyed development.

4.6.6 **Desirable densities**

It is proposed that new residential areas be planned at higher densities to achieve intensive utilization of land and reduce land component per household. This is also necessary considering increasing land prices in urban areas. The gross residential land per household includes three components :—

(i) net saleable land under plot

(ii) land under community facilities

(iii) land under access roads

Maximum feasible densities have been worked out after determining minimum dwelling size of 20 m^2 and plot size of 26 m^2. The maximum feasible incremental density with minimum dwelling space of 20 m^2 and net land component of 13 m^2/family on 2 storeyed plotted development is 900 ppha with standard level of community facilities. While with 25 sq. m. d.u.e. size in 4-storeyed group housing it is possible to achieve instant density as high as 1000 ppha. These maximum densities of 900 ppha in plotted and 1000 ppha are possible if all the dwelling sizes are of 20 m^2. Generally it may be desirable to mix various income categories to enable cross subsidies and a better social mix. In which case the density will vary with dwelling unit size. Average density should be 700 ppha to 800 ppha. The Delhi Master Plan (2001) recommends an average gross density of 400 ppha. An average density of 700 ppha would effect a saving of 50 sq. gross land/family. At city level, the additional land requirement for residential use can be reduced substantially. This would mean economising on land cost, development cost and reduction in community costs. The table number (4) gives a range of varying densities, resultant dwelling sizes and total land per family. For a specific situation, affordable land/family may be selected on the basis of land price and affordability of target households. The resultant density as given in the table could be adopted. Even in cases, where the 26 sq. m.of plot is also not affordable to the target households due to higher land prices, the plot size should not be reduced. Plots could be made affordable by other techniques mentioned below :—

(i) differential pricing in relation to location. and cross subsidy from higher income groups or commercial uses.

(ii) lowering of interest rates or increasing period of ammortisation.

(iii) lowering initial standards of infrastructure provision lowering initial cost of the structure (by use of cheaper material).

(iv) layout optimisation

(v) direct subsidies

4.6.7 **Development form**

4.6.7.1 **Plotted development.**—Basically plotted development is proposed because of distinct advantages over multi-family built housing. Plotted development offers the incrementality to improve/alter/expand the house with changing affordability priorities and capabilities. The dwelling unit in such cases reflect the socio-cultural values of the inhabitants. It also allows part of the dwelling to be rented/used for income generating uses which is so vital for low income population.

Table No. 4

GROSS RESIDENTIAL DENSITIES, LAND PER FAMILY AND AVERAGE PLOT AND DWELLING UNIT (DU) SIZES FOR PLOTTED AND GROUP HOUSING

PLOTTED								GROUP					
Gross residensity	Net Res. area/fam.	Facl. area/fam.	circle area/fam	Total land/fam.	Av. Plot size	Av. DU size	Av. floor area/ha	Net res. area/fam.	Facl. area/fam.	Circl. area/fam.	Total land/fam.	Av. DU size	Av. floor area/ha
ppha	sq.m.	sq.m.	sq.m.	sq.m.	sq.m.	sq.m.	%	sq.m.	sq.m.	sq.m.	sq.m.	sq.m.	%
250.0	126.5	33.5	40.0 (20%)	200.0	253.0	167.0 (66%)	83.50	144.5	25.5	30.0 (15%)	200.0	202.3	101.15
312.5	91.3	33.5	35.2 (20%)	160.0	182.6	120.5 (66%)	75.31	110.5	25.5	24.0 (15%)	160.0	154.7	96.68
375.0	62.8	33.5	29.3 (22%)	133.3	125.6	83.0 (66%)	62.25	87.8	25.5	20.0 (15%)	133.3	122.8	92.10
437.5	82.2	33.5	28.6 (25%)	114.3	104.4	69.0 (66%)	55.00	71.7	25.5	17.1 (15%)	114.3	100.4	87.85
500.00	41.5	33.5	25.0 (25%)	100.0	83.0	55.0 (66%)	99.50	59.50	25.5	15.0 (15%)	100.0	83.3	83.30
625.0	26.5	33.5	20.0 (25%)	80.0	53.0	40.0 (75%)	63.25	42.5	25.5	12.0 (15%)	80.0	59.5	74.37
687.5	30.7	27.5	14.5 (20%)	72.7	61.4	46.0 (75%)	58.50	42.2	19.5	11.0 (15%)	72.7	59.1	81.81
750.0	25.9	27.5	13.3 (20%)	66.7	51.8	39.0 (75%)	56.11	37.2	19.5	10.0 (15%)	66.7	52.1	78.51
775.0	24.1	27.5	12.9 (20%)	64.5	48.2	36.2 (75%)	54.40	35.3	19.5	9.7 (15%)	64.5	49.4	76.57
800.0	22.5	27.5	18.5 (20%)	62.5	45.0	34.0 (75%)	49.30	33.6	19.5	9.4 (15%)	62.5	47.0	75.20
850.0	19.5	27.5	11.8 (20%)	58.8	39.0	29.0 (75%)	49.30	30.5	19.5	8.8 (15%)	58.8	42.7	72.59
900.0	17.0	27.5	11.1 (20%)	55.6	34.0	26.0 (75%)	46.80	27.8	19.5	8.3 (15%)	55.6	39.0	70.20
1000.0	12.5	27.5	10.0 (20%)	50.0	25.0	19.0 (75%)	38.00	23.0	19.5	7.5 (15%)	50.0	32.2	64.40

(1) (2) (3)

(1) The figures in the parenthesis shows the area under circulation as a %age of total land/family.

(2) The figures in the parenthesis shows the ground coverage on av. plot size.

(3) The figures in the parenshesis shows the area under circulation as a % age of total land/family.

* For densities above 625 ppha. 6 sq.m. of facility area has been reduced assuming that the Schools would be run double shift.

* It is assumed that for high densities, where the residents would belong predominantly to the low income group, circulation area would reduce because of pedestrian accessways.

* Saturated levels of densities have been assumed for plotted development.

* 2 DU's/plot have been assumed in plotted development.

* Group housing shall be walk up apartments of 4-storeys.

* FAR = 1.4 (on net res. area)

* Coverage = 35%

* Net res. area in Group housing includes area under access roads and tot lots. Facility area is thus proportionately reduced by 8 sq.m.

* Av. DU size in Group Housing includes stairs, access corridors, etc.

* The average densities proposed by Master Plan for Delhi 2001 are 400-600 ppha.

* GROSS AREA includes area under plots, roads upto 60 feet width, tot lots, playgrounds and neighbourhood parks, high school, primary school, local shopping and other facilities viz. milk booth, community hall, police post, etc.

This form of development promotes participation of families in the development and management of housing process. It is cost effective in terms of efficient use of space/material and time. Individual families derive greater housing satisfaction by owning a piece of land. Capital for construction of the house can be raised by mortgaging the plot of land. Higher densities can be achieved in plotted development with two/three storeyed development with reduced plot sizes. The development is incremental over number of years and saturated level of intensity of development is achieved over a period of time, depending on extent and nature of market demand which forces individual owners to utilize floor space on upper floors.

4.6.7.2 **Group Housing.**—For Group Housing, four storeys development is recommended with 35% coverage and 140 FSI to be achieved. This could be permitted on plots larger than 500 sq.m. with setbacks from all sides. It is possible to achieve instant gross density of upto 1000 ppha for the d.u. size of 25 m^2. This form does not permit incrementality and is therefore not suitable for urban poor and as it involves higher initial cost of the built unit. Immediate utilization of infrastructure capacities are possible due to instant consumer demand.

4.6.8 Materials and Technology

The use of local materials should be promoted and semi-permanent construction should be acceptable in the building regulations for plots upto 100m^2 provided it is fire resistant. This is specially needed to allow incremental housing consolidation of urban poor and offer affordable technological options. Labour intensive technologies be promoted to generate employment for unskilled and semi-skilled labour. Government manuals and schedule of rates should be suitably modified to include indigenous local simple technological options which have potential for upgrading and improvement. The maintenance and repair cost may also be considered in selection of technological options and a proper trade off between lowering initial cost and increasing maintenance and repair cost be struck. The detail recommendations of the working group on "materials and technological options" working for NCU be adopted and built into the regulations.

4.6.9 Roads

Roads can be classified as vehicular and pedestrian. The minimum width of pedestrian access-ways should not be less than 3 M (with two storeyed development abutting on it). Even in this case, the road cross-section needs to be designed for proper disposition of various services of water pipes, sewer, storm drainage, carriage way and electricity poles. However, any property should not be at a distance of more than 50 m from any vehicular road to enable fire fighting by fire engines by hose pipes in case of emergency. This is also required to ensure convenient accessibility for ambulance, for serious patients.

4.6.10 Infrastructure

Low cost options for waste disposal be accepted in municipal regulations. Options with low maintenance cost be promoted for low income high density developments. At no stage community toilets be provided for economic considerations. However, shared water taps, street lights could be provided initially before individual level services are provided. Design of infrastructure network should have inbuilt provision for incremental improvement to provide individual plot level services ultimately. A separate study is required to suggest specific infrastructure options & standards which are cost effective, maintenance free and permits incrementality.

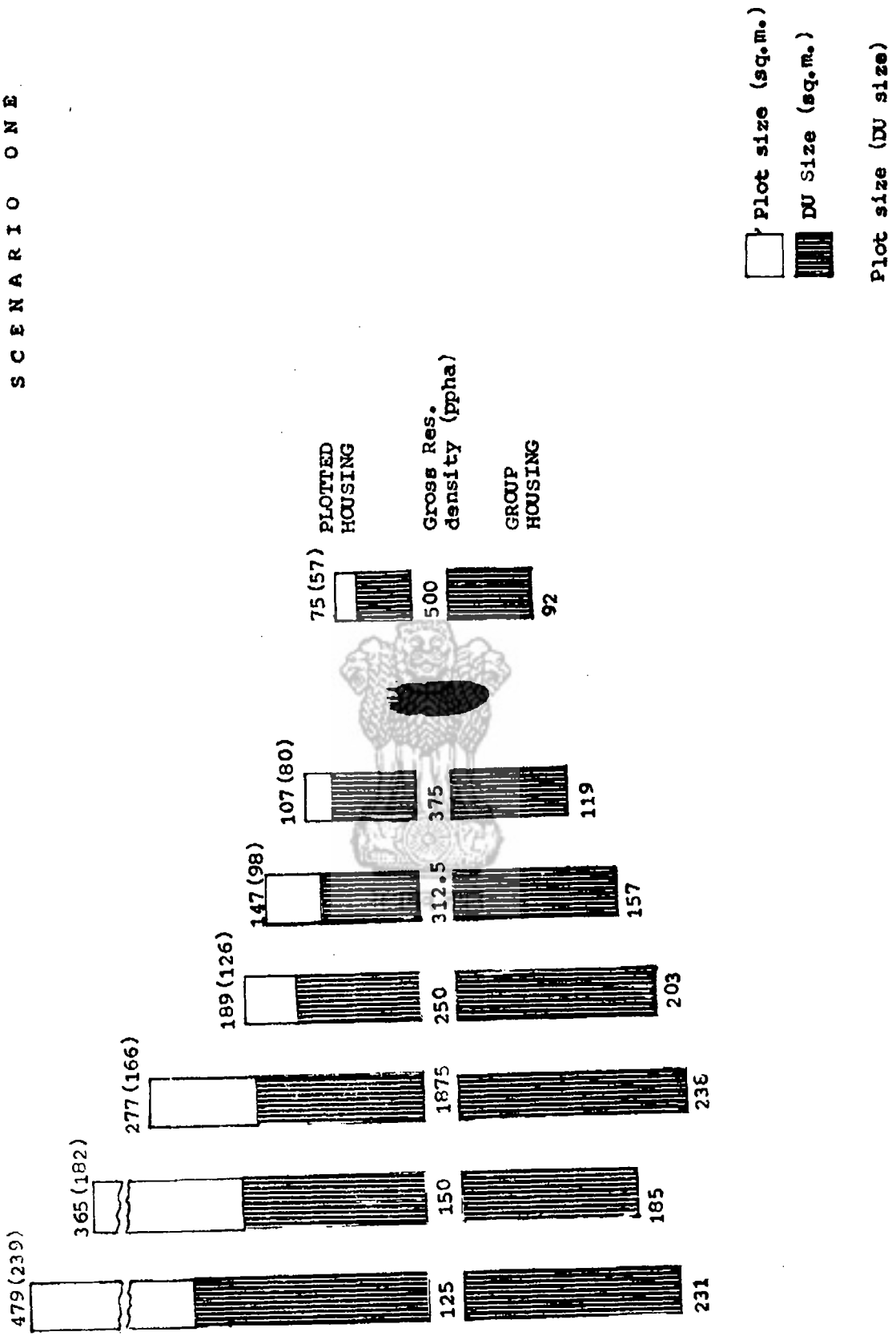
4.6.11 Layout patterns

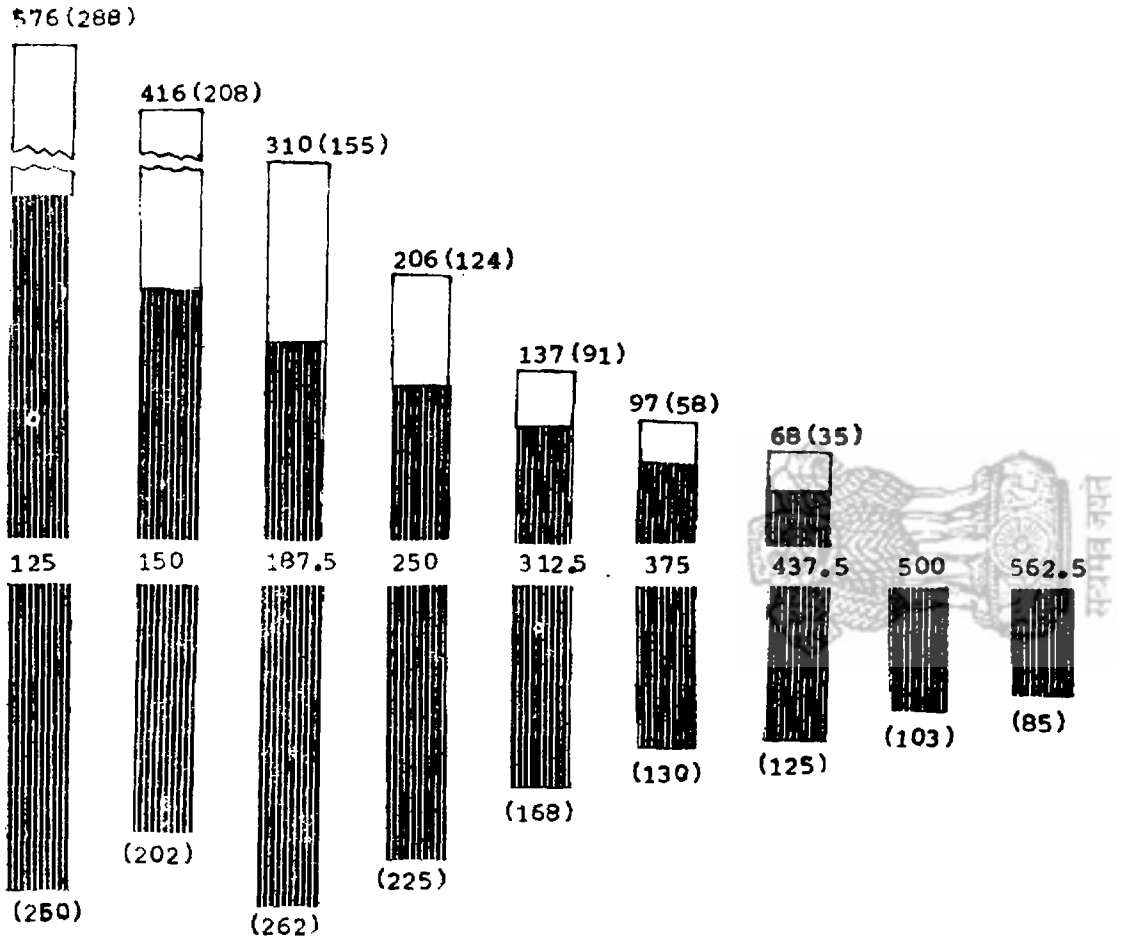
A variety of built form patterns responsive to preferences, values and activity systems of various groups can possibly be generated at micro level by granting greater freedom and flexibility to identified organised groups to personalise the built form within broad policy parameters.

Residential layouts be designed to achieve economy & efficiency of land utilization & management. This can be achieved by maximising saleable area, minimising public area and clearly delineating private, semi-private, semi-public and public uses of land to effect better management & maintenance.

4.7 People's participation

Public support be mobilised for effective enforcement of regulations. This is possible through better public relations & involvement of people in the plan making & implementation process.


SCENARIO ONE
Plot size (sq.m.)
DU Size (sq.m.)
Plot size (DU size)
PLOTTED HOUSING
Gross Res. density (pph)
GROUP HOUSING
75 (57)
500
92
107 (80)
375
119
147 (98)
312.5
157
189 (126)
250
203
277 (166)
1875
236
365 (182)
150
185
479 (239)
125
231



SCENARIO TWO

PLOTTED HOUSING

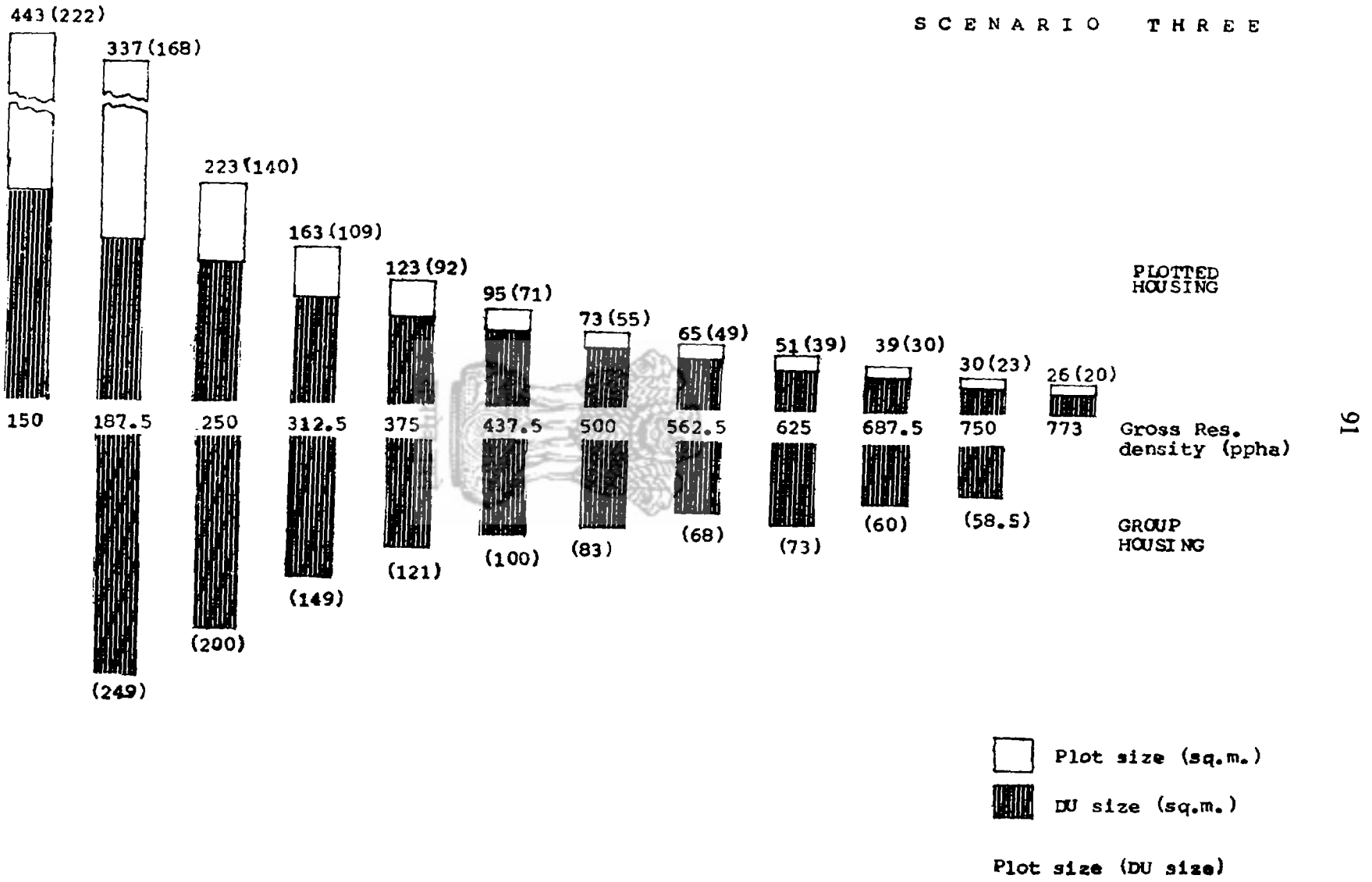
Gross Res. density (ppha)

GROUP HOUSING

Plot size (sq.m.)

DU size (sq.m.)

Plot size (DU size)


SCENARIO THREE
443 (222)
337 (168)
223 (140)
163 (109)
123 (92)
95 (71)
73 (55)
65 (49)
51 (39)
39 (30)
30 (23)
26 (20)
PLOTTED HOUSING
150
187.5
250
312.5
375
437.5
500
562.5
625
687.5
750
773
Gross Res. density (ppha)
(249)
(200)
(149)
(121)
(100)
(83)
(68)
(73)
(60)
(58.5)
GROUP HOUSING
Plot size (sq.m.)
DU size (sq.m.)
Plot size (DU size)

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Urban Housing Needs

National Buildings Organisation
And
U. N. Regional Housing Centre Escap
Nirman Bhawan, New Delhi


सत्यमेव जयते

FOREWORD

The National Buildings Organisation has been making periodical estimates of housing needs and shortages in the country. At the meeting of the National Commission on Urbanisation on 10-4-86, an 'Analysis of Housing Requirements in India' had been presented by the undersigned in which the methodology of assessment and critical issues were highlighted. The Commission had noted that further refinement was being done by NBO on the basis of 1981 census data when made available including data on some qualitative indicators of housing.

The present assessment of urban housing needs has been made on the basis of provisional Census data for 1981 and data collected by the NBO from various sources. As per this assessment, the backlog of urban housing needs as on 1-3-1981 was of the order of 5.9 million which is estimated to have gone up to 6.5 million at the beginning of March, 1987. In the absence of housing census, the estimation of housing needs made by NBO should be taken as indicative of the magnitude of the housing problem.

The salient features of the study were presented to the National Commission on Urbanisation at its meeting on 20th August, 1987 and on the basis of discussion held, a consolidated report on the study has been finalised.

The co-operation extended by the Registrar General of India and Census Commissioner, Ministry of Home Affairs in supplying the required data and permission given to use the same in the study are gratefully acknowledged.

I appreciate the pains taken by Shri Y. Seshagiri Rao, Joint Director and Shri S. K. Shivnani, Deputy Director, (Socio-economic), NBO in conducting this study expeditiously.

Sd/-

(G. C. MATHUR)

Director

National Buildings Organisation

8th September, 1987


सत्यमेव जयते

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सत्यमेव जयते

CHAPTER I

INTRODUCTION

1. Shelter as a basic human need ranks next only to food and clothing. It is to be viewed not as mere protection against rain and sun but as a base for human development. Sense of security, adequate space and privacy, healthy living conditions, improvement in skill and productivity and all round development of the human personality are additionalities to a house. Dwelling is also to be seen in the wider context of human settlement with all its implications. Provision of basic services and amenities is implied in the scheme.

Demand for House

2. Desire to own a house understandably is rather universal. It becomes 'effective demand' when supported by purchasing power. This is purely the economic concept of demand for house. As slightly distinct from this, there is demand for house *to live in* or *for shelter*. This has a social angle to it and should be understood as *need* for house or requirement of house. Affordability becomes less important in this case. Demand for house has to be distinguished from demand for other consumer goods. In the case of housing, demand is region-specific or location-specific. Another dimension of demand for house is that it has to be met from local resources whereas in the case of demand for food, clothing or many other consumable items, excess demand can be met from imports. Such kind of addition to domestic supply is not possible in the case of housing, even though import of housing technology and innovative building materials in small quantities cannot be altogether ruled out.

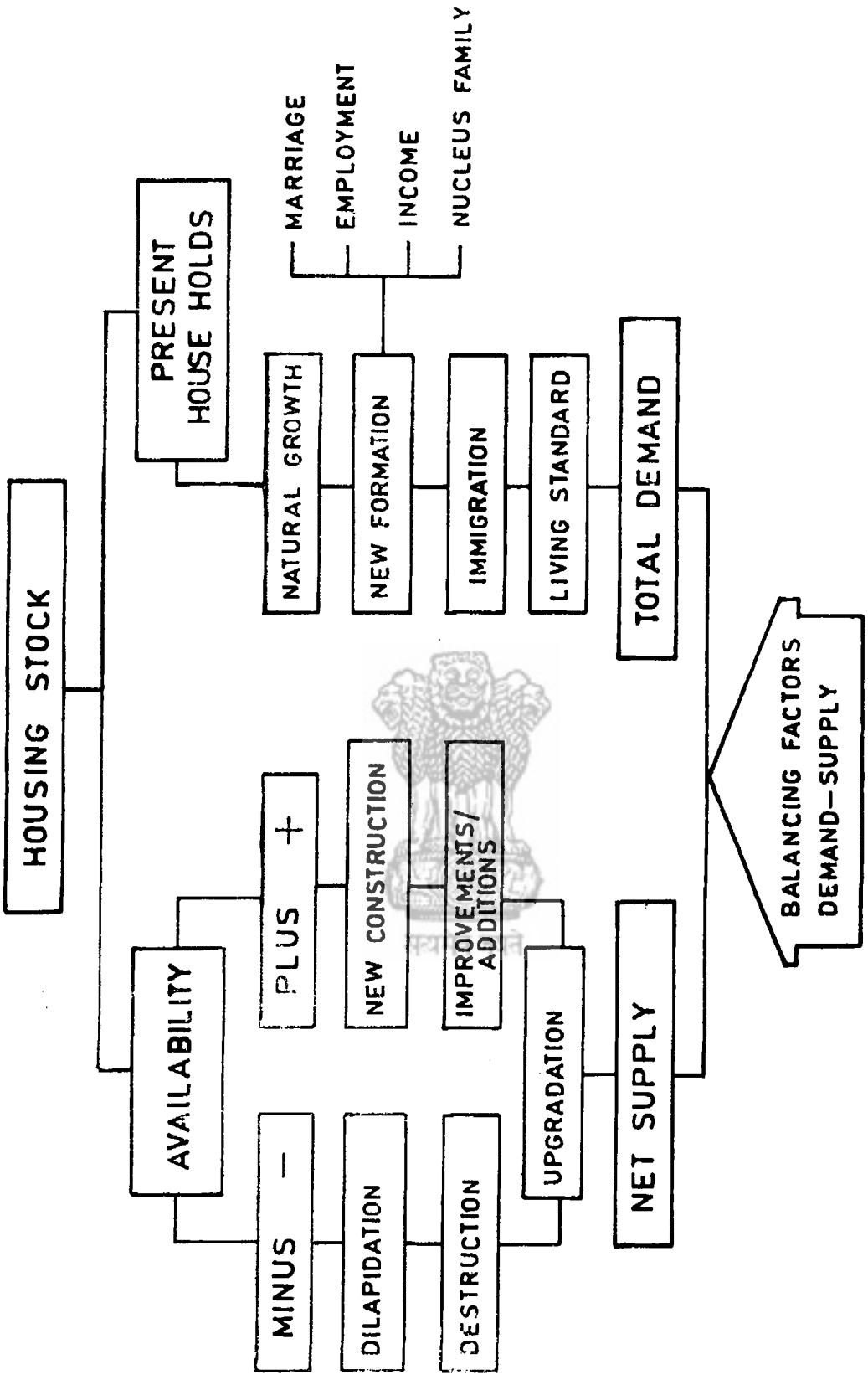
3. There is also a *quality* or *welfare* angle to housing need. This relates to quality of house, conformity to socially accepted norms of construction, living space, housing amenities, etc. The concept of socially acceptable minimum standard of housing which includes basic services and amenities, is similar to the concept of poverty line. Houses below the acceptable standard have to be upgraded by Government assistance, similar to raising the standard of living of people below the poverty line.

Housing Need

4. The broad determinants of housing needs are present number of households, natural growth in the same, new household formation, migration and rise in the standard of living. New household formation in its turn, is influenced by marriage, employment, income generation and break-up of the joint family into nucleus family. Growth in number of households is again a function of growth of population.

Supply of Housing

5. In quantitative terms, it is available housing stock, annual or periodical additions, extension and improvement and upgradation. Dilapidation and destruction on account of fire, floods and other natural calamities will reduce the available stock by the extent of such damage.



HOUSING BALANCE SHEET

CHAPTER III

HOUSING AND NATIONAL ECONOMY

6. In the previous chapter it has been noted that house fulfils a basic need and serves to promote human development. As such, private individuals who can afford to invest in houses can be expected to do so. The State also in its endeavour to promote welfare of the people, especially of the weaker sections, implements certain housing programmes largely through development plans. The following table shows the investment in housing in the various five year plans in India.

Investment in Housing in Five Year Plans

(Rs. Crore)

	Public Sector	Private Sector	Total
I	250	900	1150
II . . .	300	1000	1300
III . . .	425	1125	1550
IV . . .	625	2175	2800
V . . .	796	3640	4436
VI . . .	1491	18000	19491
VII . . .	2458	29000	31458

7. It may be seen that the outlay has gone up at progressive rates over the Plans. A big spurt in allocation could be seen in the Sixth and Seventh Plans. Another point to be noted is the predominance of private sector investment. This was as it should be. The Central schemes out of the public sector schemes were largely in the nature of institutional building and a few schemes of rental housing while the States and the Union Territories Schemes covered social housing schemes and rural housesites-cum-construction assistance schemes.

8. Housing sector occupies an important place in the national economy as seen by its contribution to national income, capital formation, and employment generation. The following table shows the income from housing and its share in national income.

Contribution of Urban Housing to National Income

(Rs. Crores)

(AT CURRENT PRICES)

Year	Income from residential Housing		National Income (GDP and factor cost)	Col. 2 as % of Col. 4	Col. 2 as % of Col. 3
	Urban	Total*			
(1)	(2)	(3)	(4)	(5)	(6)
1970-71	445	1039	36452	1.22	42·83
1978-79 . . .	1260	2389	87058	1·45	61·19
1979-80	1339	2701	95511	1·40	49·57
1980-81	1364	2858	113846	1·20	47·73
1981-82	1447	2948	130763	1·11	49·08
1982-83	1489	3093	145280	1·02	48·14
1983-84	1649	3344	171713	0·96	49·33
1984-85	2059	3873	189417	1·09	53·16

*From Real Estate, Ownership of Dwellings & Business Services.

Source : National Accounts Statistics — January, 1987—Central Statistical Organisation.

9. Housing accounted for 16.72% of the gross capital formation in the country in the year 1984-85 as can be seen from the following table :—

Capital Formation in Housing (At current prices)

(Rs. Crores)

	1970-71	1980-81	1983-84	1984-85
1. Gross Domestic capital formation	7,177	31,476	45,607	52,389
2. Gross Capital formation in housing	9,68	4,163	6,641	7,186
3. 2 as percentage of 1	13·49	13·23	14·56	16·72

Source : Ibid

10. In terms of employment generation also, housing sector plays a significant role. This is very important in the context of rising unemployment and under employment in our country. According to an NBO estimate, investment of Rs. 1 crore in residential building construction can provide direct employment of 565 man years and indirect employment of 904 man years at 1983-84 wage/price level. Construction sector also offers employment to a sizeable number of skilled and unskilled workers. According to 1981 census, nearly, 2.2 million workers were employed in the construction activity in India. This represents 1.0% of the total workers in the country.

CHAPTER III

URBAN HOUSING SUPPLY

11. Housing census is the known means of collecting comprehensive data on housing periodically. But such a census has not been conducted in India, so far. The National Buildings Organisation at the national level has been trying to organise collection of limited construction statistics under the 'Three-Tier Scheme' through the State Bureaux of Economics and Statistics. Data flow is envisaged from two sources: (i) Public Works Departments and other construction departments, and (ii) Municipalities and Local Self Government Departments. While the former furnish data on value of work done, number of units constructed, floor area added, etc., the latter furnish data relating to private sector house building—number of housing plans sanctioned and completion certificates granted and other relevant details. So far as the Central PWD and other major construction departments are concerned, data is obtained directly by the NBO. The Three-tier scheme does not cover rural areas. It does not also cover class V & VI towns with population less than 10 thousand. Apart from these deficiencies, the implementation of the scheme itself has not been satisfactory. Partial coverage and partial reporting are the main drawbacks of the scheme, with the result that complete data on housing cannot be built up and a national level picture presented.

12. The National Sample Survey Organisation (NSSO) conducted, at the instance of the NBO a special survey on 'Investment in and Financing of Building Construction in urban areas' for the biennium 1972-74. The survey provided estimates of investment made by the household sector in urban areas in different types of buildings and sources of finance for the same. The survey provided useful information but limitations of survey data for projections are obvious.

13. Decennial population census therefore, happens to be practically the only source of information on housing activity. Even this is not free from limitations: (i) Data is available only once in 10 years; (ii) It is out of date even by the time it becomes available; (iii) It does not also provide all the details required for meaningful analysis.

14. Necessary details of 1981 census have been obtained from the Registrar General of India and used in this exercise. The following table shows the urban housing supply as at the end of last three census years.

Urban Housing Supply

	1961	1971	1981
Urban Housing Stock (in millions)	14·1	18·5	27·6* (28·0)**
Decennial Growth Rate (percent)	..	31·2 (1961-71)	51·4* (1971-81)

*Excludes Assam where the Census has not been conducted.

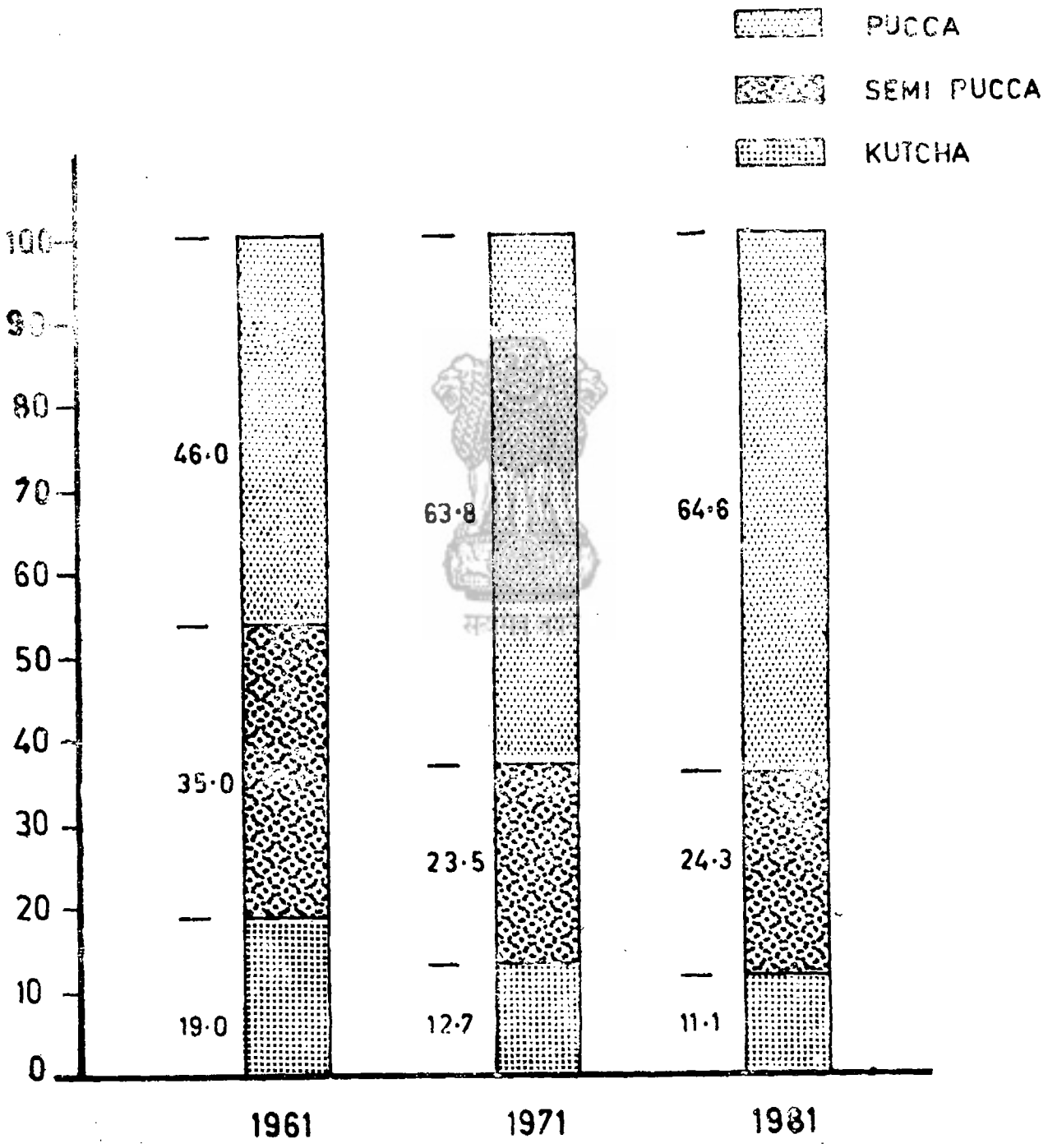
** Includes estimated figure for Assam.

During the decade ending 1981, 9.5 million houses had been added compared to 4.4 million during the previous decade. The decennial growth rate of housing stock in the decade ending 1981 had thus been very impressive at 51.4 compared to 31.2 in the previous decade. This gives a rate of construction of 7.1 houses for 1000 population during the decade 1971-81 as against 4.7 in the previous decade. In the urban context, the rate of construction of pucca houses should be the real indicator of housing satisfaction, level of comfort and livability. The decennial growth rate of construction of pucca houses during 1971-81 declined to 53.4 per cent compared to 81.5 per cent during the previous decade. The rate of construction of pucca houses per 1,000 population worked out 4.7 during 1971-81 compared to 5.6 during the previous decade. This was despite an impressive increase of pucca houses during the decade ending 1981. This implies that kutcha and semi-pucca houses had registered increase over the previous decade. There is, therefore, great need in urban areas not only for new construction but also for upgradation. Residence is the most predominant use to which a house is put. Some houses have been partly put to commercial or industrial uses besides as residences. These also have been taken as residential units for this study.

15. The number of houses alone cannot convey the full implication. It is the quality of a house or the type of structure that matters. Based on the predominant materials of wall and roof, houses can be classified as *pucca, semi-pucca* and *kutcha.* Kutcha can be sub-divided into *serviceable kutcha* and *non-serviceable kutcha.* In urban areas, pucca and semi-pucca houses, alone can be taken as conforming to the desired norms of comfort or convenience. Kutcha houses with walls and roofs built largely of filmsy materials do not fit well in the urban context. Such

URBAN HOUSING — TYPE OF STRUCTURE

(PERCENTAGE)



houses need upgradation. Therefore, in estimating the effective stock of houses in urban areas, pucca and semi-pucca houses alone have been considered.

16. The following table shows the classification of urban houses by types of structures in the last 3 censuses. It may, however, be noted that for the year 1981, the approach of the census had been *households* instead of *houses*. Statistics give distribution of households according to the type of structures whereas in the previous two censuses, it was distribution of houses. All the same, it may not make much difference if we interpret households as living in a 'dwelling unit'. This dwelling unit for 1981 has, therefore, been taken as a proxy for house in the present analysis and the percentages applied to housing stock.

Distribution of Urban Residential Houses by Type of Structures

(in millions)

Type of structure	1961	1971	1981*
Pucca	6·5(46·0)	11·8(63·8)	18·1(64·6)
Semi-pucca	4·9(35·0)	4·3(23·5)	6·8(24·3)
Kutcha	2·7(19·0)	2·4(12·7)	3·1(11·1)
TOTAL	14·1(100·0)	18·4(100·0)	28·0(100·0)

*Includes estimated figures for Assam Figures in brackets are percentages.

17. Rise in the percentage of pucca houses over the census periods is a notable feature. It indicates that the tendency in urban construction is towards pucca structures. Semi-pucca houses which mark a process of transformation from kutcha to pucca stage ranked next in importance. Such structures accommodated about 24% of the urban households in 1981. It can be expected that eventually, the semi-pucca houses would be converted into pucca houses, resources permitting. The small percentage of urban households living in kutcha structures in 1981 (11.1%) compared to about 12.7% and 19% which such houses formed in 1971 and 1961 respectively again is a healthy sign. It indicates that kutcha structures are erected as a temporary measure for meeting the immediate requirement of shelter and, with the passage of time they are likely to be upgraded into semi-pucca and pucca houses. With the availability of cheaper technology and building materials, the sections of urban population living in kutcha houses can be expected to go in for improvement and upgradation of houses over a period of time. Out of the 9.5 million houses that have been added during 1971-81, 6.3 million were pucca houses and 2.5 million semi-pucca. Pucca houses constructed during this decade exceeded such construction during the previous decade by 1 million. During 1961-71, net addition was more by way of upgradation than new construction as could be seen from the following table.

Addition to Housing Stock (in millions)

	1961–71	1971–81
Pucca House	5·3	6·3
Semi pucca	—0·6	2·5
Kutcha	—0·3	0·7
TOTAL	4·4	9·5

18. The above picture of pucca houses gaining in strength numerically and declining importance of kutcha houses in urban areas, has been corroborated by the National Sample Surveys conducted during 1953-54, 1964-65 and 1973-74 inter censal years. The following table presents the relevant data.

Percentage Distribution of Households by Type of Structures

Type	1953–54	1964–65	1973–74
Pucca	27·64	52·75	64·52
Semi-pucca	38·97	17·19	19·64
Kutcha	24·49	29·95	15·84
Others	8·30	0·11	..
TOTAL	100·00	100·00	100·00

Source: NSSO's Rounds 26, 195 & Sarvekshana Vol.I No. 2, 1977

The households occupying pucca and semi-pucca houses in 1973-74 rose to a little over 84% compared to about 70% in 1964-65 and about 66% in 1953-54. Kutcha houses provided shelter to about 16% of the urban households in 1973-74. As per the 1981 census the urban housing stock consisted of 18.1m pucca and 6.8m semi-pucca structures making a total of 24.9 million units. This marked an increase of 55% during the decade. These categories of houses formed about 89% of the total stock in 1981.

Agency-wise supply

19. Details of agency-wise contribution of the urban housing stock are not available in the census data. The NBO tried to collect this data from different sources in order to estimate the role of government, public sector, and organised sector in housing activity. Provision of housing is considered to be a welfare measure by the employers, and many of the public and private sector employers including Central and State Governments have, therefore, been providing housing accommodation to the extent possible to their employees. It has been estimated

that about 6.5 percent of the total urban housing stock has been contributed by this rental housing provided by all the agencies. In addition to this, the Government through the Social Housing Schemes had also contributed around 2.4 per cent of the urban housing stock. The overall contribution under the Rental Housing Scheme and Social Housing Scheme had been of the order of 25 million residential units, as in 1981. Institutional finance for house construction provided by LIC, HUDCO and Co-operatives has contributed 6.26 lakh dwellings up to 1981. These financial agencies through provision of loans for house construction have been adding about 40,000 units annually. An estimated 2.3 per cent of the total urban stock has been contributed by these agencies.

20. Estimated agency-wise break-up of the rental housing together with contribution made by the Co-operative Sector, Private Corporate Sector as well as housing supply under the Social Housing Scheme of the Government is indicated below.

Agency wise Housing Supply
(as on 31-3-1981)

	(in lakhs)	%to total urban housing stock
1. Public Sector (Staff Housing)		
(a) Central (CPWD, P & T, MES Research/Financial Institutions, Public Sector Undertakings, Police Housing, etc.)	15·09	5·4
(b) State/U.T.s (State & L.S.C., State Public Undertakings, etc.)	2·87	1·1
Sub-Total . . .	18·06	6·5
2. Social Housing Schemes . .	6·54	2·4
3. Co-operative Sector . .	6·26	2·3
4. Private Corporate Sector .	2·71	2·0
	33·57	12·2

21. Housing supply by major construction agencies as at the end of March, 1981 and 1986 is indicated in the following table. The information has been obtained by the NBO from the various concerned agencies through correspondence. In respect of some agencies, the source has been the annual administrative reports.

Housing Supply by Major Agencies
(Units in Nos)

Institution	As on 31-3-81	31-3-81
I. CENTRAL		
(a) CPWD	61,855	82,671
(b) P & T	..	17,335
(c) Security Forces (MES, Airforce)	1,49,175	1,98,539
(d) Railways	5,67,271	5,81,509
(e) Autonomous Institutions (ICAR, ICMR, CSIR, Other Research Institutions) .		15,350
(f) Financial Institutions (Banks, LIC, RBI)	2,00,000 (Estimated)	19,979
(g) Police Housing		1,94,008
(h) Universities	..	24,715
(i) Public Sector Undertakings	4,77,528	6,63,938
(j) Housing for Plantation Workers	23,336	38,613
II. STATES/U.T.s		
(State Govt. & LSG at the rate of 25000 p.a. State Public Undertakings) . . .	2,96,775	4,21,775
	18,05,940	22,58,432

Housing Amenities

22. For a comfortable living, essential facilities like electricity and water supply as well as toilet and bathroom facilities should be available in the house. The 1981 census collected data on the number of households enjoying the housing amenities like electricity, toilet, drinking water supply etc. The earlier censuses however have not collected such information. Temporal comparison, therefore, is not possible. The percentage of households enjoying the facilities as per

1981 census is indicated in the following table :—

Facilities*	Percentage of Households
(i) Electricity	62·51
(ii) Toilet	58·15
(iii) Drinking water supply (within premises) .	52·17

*Excludes Assam.

23. The cross classified data by type of structures and the availability of these facilities is not available. However, the following picture has been built up by indirect method based on the following assumptions :—

(i) All the kutcha houses, which are mostly in the slum areas and some of them in unauthorised colonies, are taken as not having these facilities.

(ii) Similarly, all the semi-pucca structures which are built by economically weaker sections and people in the informal sector also do not have these facilities.

(iii) Still, the number of houses without these amenities exceed the total of these two categories which implies that some of the pucca houses also did not provide these facilities. It has been estimated that 2.7 per cent of the pucca houses also did not possess these facilities. On the whole, it has been estimated that a little over 52 per cent of the urban houses provided all the three facilities, as can be seen from the following table :—

Facilities*	Percentage
(i) Kutcha houses without these facilities .	10·6
(ii) Semi-pucca houses without these facilities	24·2
(iii) PUCCA HOUSES	
(a) Without these facilities . . .	2·7
(b) Without water supply & toilet . .	4·2
(c) Without water supply . . .	6·1
(d) With all the facilities . . .	52·2

* Excludes Assam.

Physical Condition of Housing Stock

24. Physical condition of a house is a very important aspect. It determines the residence-worthiness or livability. House, like any other consumer durable, has a certain life and, subject to proper maintenance and repairs during its economic life, it provides comfortable shelter. A house has to be rebuilt if it had lived its full life. Otherewise, though the physical structure may continue, it would be risky to live therein. What should be the rate of replacement or reconstruction depends upon the age of the building. The census does not provide data on the age of the housing stock. The NSSO conducted sample surveys on Housing Conditions in various rounds the latest being in 1963-64, which *inter-alia* provided information on the age distribution of the sample houses. Assuming the same age distribution for the 1961 housing stock, estimation has been made for 1981 housing stock. In regard to houses constructed during the decades ending 1971 and 1981, it has been assumed that the new construction had been uniform throughout the respective decades. The necessary additions in number of years have been made to these houses and an approximate picture of the age composition of the housing stock as per 1981 census data arrived at. The following table presents the estimated age composition of housing stock.

Age Composition of 1981 Housing Stock

Age (No. of years)	Percentage of Houses
0—10	34·0
10—20	15·8
20—40	29·2
40—60	11·0
60—80	5·8
80 and above	4·2

25. According to this, about 4 per cent of the houses happened to be more than 80 years old and hence, warrant replacement. It may be noted that this applies to pucca structures only since it is unlikely that kutcha or semi-pucca houses last so long. In these cases, practically annual maintenance and periodical major repairs are undertaken to prolong their life.

Displacement on account of major irrigation projects

26. Major irrigation projects normally involve displacement of persons (housing stock) on account of submersion etc. But they are normally in remote rural areas where the housing stock itself is largely kutcha type. As such, the likelihood of resettlement of houses in urban areas may be negligible.

Damage to housing stock due to natural calamities/disasters

27. Occurrence of natural calamities like floods, cyclones, earthquakes etc., and their degree of severity cannot be predicted with any certainty. Therefore, damage to or loss of housing stock owing to the natural calamities cannot be assessed properly. It may be noted that in this study the existing housing stock and the net addition thereto have been taken into account. Allowance has also been made for deducting from the available housing stock sub-standard houses like all kutcha houses in urban areas

which do not conform to the acceptable structural standards. In net addition, by implication allowance has already been made for loss on account of sub-standard kutcha houses and old and dilapidated housing stock which are vulnerable to destruction and damage due to natural disasters.

28. NBO obtained from the Department of Agriculture and Co-operation, Ministry of Rural Development, state-wise estimates of damage caused to housing stock owing to natural calamities (floods, cyclones, landslides etc.) from 1971 onwards. Statement giving details is at *Annexure-I*. The Ministry of Rural development was not able to provide break-up of the damage into rural and urban. It is, therefore, not possible to have an estimate of damage to urban housing stock due to the natural calamities. Further, it has also been observed that the damage in large number of cases had been partial damage but not total destruction.

29. The bulk of loss of houses due to natural disasters occurs in the rural areas. In urban areas, however, as the majority of houses are pucca or semi-pucca constructions, the loss of houses due to natural disaster can be assumed to be low.

CHAPTER 4

URBAN HOUSING NEEDS

30. In the context of shelter, it should be housing needs that should be relevant but not housing demand. Housing demand in purely economic terms, would amount to housing requirement backed up by purchasing power. In the case of majority of the poor and weaker sections of the people, and low income groups of families, housing demand in this sense of effective demand almost becomes irrelevant in so far as they just do not have the means. Such sections of people, therefore, would perforce be left out in the calculation. Therefore, housing need has to be considered as the relevant factor. This concept also appears justified in the light of welfare state and the Government's concern for promoting the well being of the people.

31. Reliable estimates of housing needs are a pre-requisite for formulating a meaningful housing policy and programmes and their evaluation. These estimates indicate the magnitude of the housing problem while changes in the level observed at regular intervals provide an index of the extent to which programmes and policies are meeting the housing needs of the population effected. In Chapter I, the broad determinants of housing needs have been listed. The same may be considered in order to calculate the shelter need as in the year 1981 and see how it compares with the housing supply estimated in the previous chapter.

Growth of Urban Areas and Population

32. Since we are concerned with urban housing need we have to examine first the growth of urban areas or number of towns and cities and the population thereof.

At the beginning of the current century, there were 1851 towns in the country. By 1951 they rose to 2890. They were 2421 and 2636 in 1961 and 1971 respectively. According to 1981 census, there were 3245 towns. From the beginning of the current century, the number of towns had grown by 75%. The following table shows the percentage distribution of towns by size-class from 1901 to 1981 at different census years.

Class	Population	1901	1951	1961	1971	1981
I	1 lakh & above	1·4	2·6	4·3	5·6	6·7
II	50,000—99,999	2·3	3·3	5·4	6·9	8·3
III	20,000—49,999	7·4	11·6	19·0	22·1	22·8
IV	10,000—19,999	21·4	21·8	30·8	33·1	32·3
V	5,000—9,999	40·9	40·0	31·5	25·7	22·9
VI	Below 5,000	26·7	20·6	9·1	6·5	7·1
	TOTAL	100·0	100·0	100·0	100·0	100·0

It may be seen that while towns in Class-I to IV categories together increased to form 70 per cent of the total towns in 1981 compared to 32 per cent in 1901, the other categories of towns i.e., Class-V and VI showed a steady decline over the period under consideration. This indicates that urbanisation, once it starts tends to grow faster.

33. Such increase in number of towns would naturally lead to increase in urban population. From 10.8% of the total population in 1901, urban population increased to 23.3 per cent by 1981. The decennial rate of growth of urban population had been phenomenal. The rate had been highest at 46.39 per cent during the decade ending 1981. The uptrend continued throughout the period except for the decade ending 1961. It may also be noted that the rate of growth of urban population had exceeded the rate of growth of total population. The details are presented in the following table.

Urban Population* (in lakhs)

(1901—2001)

Year	Total Population	Decennial growth rate	Urban Population	Decennial growth rate	Urban Population as % of the total Population
1901	2384	..	259	..	10·8
1911	2521	5·75	259	3·35	10·3
1921	2533	(—0·31)	281	8·27	11·2
1931	2789	11·00	335	19·12	12·00
1941	3187	14·22	442	31·97	13·90
1951	3611	13·31	624	41·42	17·30
1961	4392	21·64	789	26·41	18·00
1971	5482	24·80	1091	38·24	19·90
1981	6852	25·80	1597	46·39	23·30
1991**	8370	22·15	2300	44·02	27·50
2001**	9860	17·80	3260	41·74	33·10

* *Source* : Urban Statistics, December, 1985, TCPO.

** Projections by CSO.

Distribution of urban population amongst the various categories of towns may be seen from the following table.

Distribution of Urban Population

Class of Towns	1981	1971	1961	1951	1901
I	60·4	55·8	50·2	43·4	25·8
II	11·7	11·3	11·1	10·4	10·8
III	14·4	16·3	17·9	16·0	16·0
IV	9·5	11·3	13·0	14·0	20·9
V	3·6	4·7	7·3	13·1	20·2
VI	0·5	0·5	0·9	3·2	6·3
	100·0	100·0	100·0	100·0	100·0

34. Concentration of urban population in Class-I towns is evident. This may be because of the various "Pull" factors. Curiously, the next level of concentration was Class-III towns though, the trend was declining. A gentle uptrend in the concentration rate of population in Class-II towns also could be noted. The whole problem of urban population in short, appears to be one of Class-I towns/cities. It may be seen that the urban population of India increased by 49.86 million during the decade ending 1981 recording a rise of 46.39%. Such an increase could not entirely be attributed to natural growth. Some part of it could be due to migration. A clear assessment of the quantum of migration is difficult to make. Changes in residence during the period 1971-81 from rural to urban or urban to urban should be the base on which such estimation could be made. But in 1971 census, a question of residence at the specific point of the 1971 census, was not canvassed nor was a question asked as to where one resided 10 years earlier. Therefore, migration between 1971-81 could be taken as causal factor for the growth of urbanisation during the period. On the assumption that during the span of this 10 year period (1971-81), there had not been more than one change in place of residence, estimation of quantum of migration could be made. The following table gives the number of migrants who have resided at the place of enumeration for period from 0 to 9 years.

Migrants whose duration of residence was 0–9 years

Place of last residence		Place of enumeration ('000) Total	Rural	Urban
Within the State	Total	70,162	48,865	21,297
	Rural	55,796	43,397	12,399
	Urban	14,196	5,353	8,843
Outside the State	Total	10,860	4,043	6,817
	Rural	6,273	2,936	3,337
	Urban	4,449	1,037	3,412
Outside the country		1,177	626	551

Source : Census of India, 1981, Series-I, Part-II special.

35. A total of 157.36 lakhs persons migrated from rural to urban areas in the country during the decade 1971-81. As against this, the urban to rural migrants were 63.90 lakhs. The net addition to urban areas, therefore works out to 93.46 lakhs. In addition to this, 5.51 million persons migrated to urban areas of the country from abroad. Thus, the total addition to urban population in the decade ending 1981 had been of the order of 98.97 lakhs persons. The figures of migration from urban areas of the country to other countries are not available. Based on these figures, 9.18 per cent increase in urban population could be attributed to migration while the rest namely, 37.06 per cent was attributable to natural increase and addition of new towns.

Reasons for migration could be many and varied such as employment, education, marriage (particularly in the case of women), family movement etc., but it is enough for the present study to note the fact of migration and the rough quantum of the same. Thus, natural growth in population and migration together added significantly to urban population resulting in strain on the existing housing stock.

House for Household

36. Increase in urban population is but one aspect of the issue. The other elements also need to be examined in order to understand this issue and arrive at correct estimation of the housing needs. House is needed for a household to live in. The household may comprise a single individual, a family or a number of persons living together but sharing food from a common kitchen. Family may be nucleus family or joint family. It is, therefore, number of households that is more important than population in the context of need for housing. In 1981 the total number of urban households in the country was 28.9 (excluding Assam). After adding the estimated figure for Assam, it becomes 29.3 million. The number of occupied residential houses of all structural types was 27.6 million, (28.0 with estimated figure for Assam). On the assumption that each household requires a house, the difference between number of households and houses should indicate the unsatisfied demand. The gap in 1981 worked out to 1.3 million as shown in the table below

(in millions)

Census year	House-holds**	Occupied Units	Housing Gap	Addition to Hhs	Addition to Stock
1951 . .	12·8	10·3	2·5	..	..
1961 . .	14·9	14·1	0·8	2·1	3·8
1971 .	19·1	18·5	1·0	4·2	4·4
1981* .	28·9	27·6	1·3	9·8	9·1
	(29·3)	(28·0)	(1·3)	(10·2)	(9·5)

* Excludes Assam

**Includes institutional households as well as houseless households (Figures in brackets include adjusted figures for Assam).

37. It is worth noting that addition to housing stock exceeded the addition to households in the decades ending 1961 and 1971 while during the decade ending 1981 addition to households exceeded that of housing stock by 0.7 million thus aggravating the situation.

Shelterless Households

38. A house, depending upon its size will be able to accommodate more than one family or household. The residential or dwelling units can thus be more than the number of houses. (Census defines a house as a complete house or a portion thereof having a separate entrance from the main road/street). It can, therefore, be expected that some of the households in excess of the available houses could accommodate themselves as co-sharers in the existing residential buildings. The other households would have to go without shelter. The 1981 census put such shelterless urban households at 2 lakhs consisting of 6 lakhs persons. They were those who virtually had no roof over their head. They live in the open, on the road side and pavements on platforms of take shelter under humepipes, under staircases or in temples mandaps and the like. Shelterless persons were 2.95 lakhs in 1961. Their number rose to 4.66 lakhs by 1971 and further to 6.16 lakhs by 1981. Though, the decennial growth rate in the decade ending 1981 was 32% compared to 58% during the previous decade, the absolute increase in the number of shelterless persons was of the order of 1.5 lakhs. Though majority of them were single member households, some had even six members each as can be seen from the following table.

Frequency Distribution of Urban Shelterless Household (1981) ('000)

No. of Members	1	2	3	4	5	6	Total
No. of Households	99	23	20	17	13	31	203
%of Total	48·8	11·3	9·8	8·4	6·4	15·4	100

There were some couples also among the shelterless households as may be noted from the table below.

No. of Couples Among Shelterless (1981) 1981 census

No. of married couples	Number	Percentage
0	93	45·8
1	41	20·2
2	4	2·0
3	1	0·5
4	64	31·5
TOTAL . . .	203	100·00

39. The need for providing shelter to these shelterless households should receive *top most* priority. They represent the *deprived lot* who do not have any access whatsoever to shelter. If housing need is restricted to meeting the demand of the shelterless only, the urban shortage could be put at 2 lakhs.

Sub-standard Houses

40. Housing has a qualitative angle too. Quality of the structure of the house and its present condition, space provided to each household are some of the relevant aspects. Three broad structural types of houses could be identified in the urban context: pucca, semi-pucca and kutcha. While pucca and semi-pucca houses can be expected to provide reasonably comfortable shelter during all the seasons of the year, kutcha structures provide only rock bottom level of shelter. Construction of these houses is such that they are not considered fit for human habitation. Living in such houses would only mean *privation* to the occupants. These persons have just a roof over their head but nothing more and none of the other comforts which a house normally should provide. Such kutcha structures pose fire and other hazards and may also cause environmental pollution. In the urban set up, therefore, kutcha structures need upgradation so that they become livable. In 1981, kutcha houses in urban areas were 3.1 million. If these houses are deleted from the available housing stock, the number of livable habitable houses would be 24.9 million. Juxtaposed with the number of households, this would leave a gap of 4.4 million (4.2 million, excluding Assam).

Old Houses

41. A house has a life which, it can be expected to live in full, subject to proper maintenance and periodical repairs. Houses which have outlived their life are to be reconstructed in the interest of safety of dwellers. In 1981, it was estimated that 1.2 million houses (4.2 per cent of the total stock) were more than 80 years old. These, therefore, should be taken as not habitable. If these are deleted from the total stock of pucca and semi-pucca houses, the net number of houses available for safe habitation would work out to 23.7 million. The unsatisfied housing demand as in 1981 in that case works out to 5.2 million.

Congestion and Overcrowding

42. A house normally provide enough living space and privacy. Too many persons living in small accommodation is not healthy. The following table shows the percentage distribution of houscholds by no of rooms available to them.

Number of Rooms	1961	1971	1981
1 . . .	53·1	50·1	45·5
2 . . .	24·7	26·9	72·7
3 . . .	10·3	11·4	12·1
4* . . .	11·9	11·6	14·7
TOTAL .	100·0	100·0	100·0

Improvement in the level of accommodation over the census decades is evident. Families occupying single room tenaments gradually declined from 53.1% in 1961 to 45.5% in 1981.

43. A better indicator in this regard, however, is distribution of households cross-classified by composition of the households and No. of rooms in the dwelling unit. The same is indicated in table below.

No. of members in the Hh.	No. of rooms in the housing units						
	No Exclusive room	1	2	3	4	5	6	Total
1		4·77	1·00	0·78	0·12	·04	·05	6·26
2		5·63	1·86	0·58	0·24	·09	·10	8·50
3 . . .		6·53	2·80	0·97	0·39	·13	·19	11·01
4		7·47	4·20	1·60	0·71	·25	·22	14·45
5		7·13	4.76	1·94	0·88	·32	·33	15·36
6*		13·76	12·91	6·71	3·91	1·68	2·27	41·24
Unspecified . . .								
TOTAL	0·52	45·29	27·53	12·58	6·25	2·51	3·16	100·00*

*Row-wise & Column-wise totals do not add up to 100 because of exclusion of institutional as well as houseless households.

Assuming that 3 or more persons per room as amounting to crowding and unhealthy living, the extent of overcrowding works out of 47.80% in 1981. i.e., 47.8% of the households were having inadequate accommodation or living under overcrowding and congestion.

Overcrowding and Couples

44. The number of married couples in the household and number of rooms available would be a more refined indicator of crowding. The minimum that one can consider decent is a separate room for each couple. The following table shows the percentage distribution of households cross-classified by number of couples and number of rooms.

Households Occupying

No. of married couples	No. Exclusive Room	1	2	3	4	5	6†	Unspecified	Houseless	Total
0	0·16	7·48	2·44	0·83	0·37	0·14	0·17	0·23	0·32	12·16
1	0.28	32·04	19·73	8·01	3·73	1·38	1·44	0·72	0·14	67·47
2	·04	2·62	3·81	2·18	1·35	0·57	0·75	·12	·01	11·45
3	·01	0·38	0·66	0·66	0·50	0·26	0·41	·03	..	2·92
4 .	..	0·06	0·11	0·11	0·15	0·09	0·18	·70	·02	0·77
5 .	..	0·01	0·02	0·02	0·03	0·02	0·07	·01	..	0·17
6 .	..	..	..	·01	·01	·01	0·04	..	..	0·07
Unspecified .	·03	2·89	0·87	0·30	0·14	·05	·07	·49	·22	5·06
Total	0·52	45·48	27·65	12·12	6·18	2·52	3·14	1·59	0·71	100·00

45. The area of overcrowding in the sense of each couple not having a separate room is indicated by the stepped portion in the table. The additional requirement of rooms for conforming to the acceptable minimum standard indicated above would work out to 1.4 million. Since all these variants of overcrowding, congestion etc., are qualitative in nature, assessment of the additional requirement or shortage of housing in quantitative terms may not be feasible. In fact, this aspect is already taken care of in the calculation of households in excess of housing stock. The number of households in excess of available housing stock was put at 1.3 million of which 0.2 million were houseless. The residual 1.1 million represent involuntary sharing of accommodation.

Housing Amenities

46. It has been pointed out in Chapter-III that a house, to be complete, should also provide the essential amenities and facilities like electricity, water supply, toilet and bathroom facilities. It was observed that the kutcha and semi-pucca houses were devoid of these facilities altogether. Only some of the pucca houses provided these facilities. On the whole, 52.2 per cent of the urban houses provided these facilities. The number of houses wanting in these facilities worked out to 13.4 million.

Backlog of Housing Need

47. Taking the qualitative aspects of housing also into account besides the absolute shortage in numbers, the housing need as on 1-3-81 can be summed up as follows:—

Urban Housing Need (Backlog)

As on 1st March, 1981 (In millions)

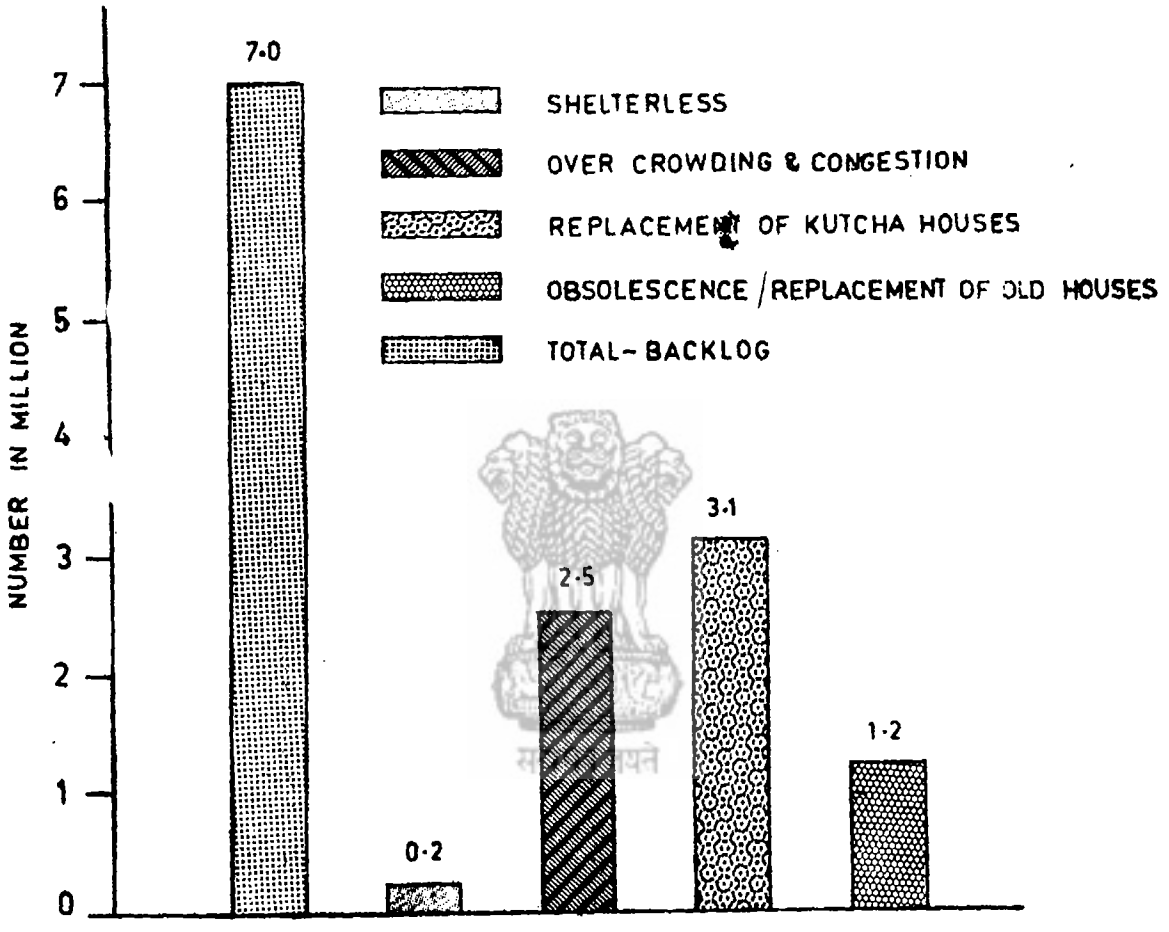
Component	Number
1. Houseless	0–2
2. Overcrowding and congestion	
(a) Excess of households over houses .	1·1 (Excluding houseless)
(b) No. of married couples requiring separate Room/Houses	0·3
3. Replacement of kutcha houses . . .	3·1
4. Obsolescence/replacement of old houses .	1·2
TOTAL	5.9

Break up by Socio-Economic Groups

48. Break up of the backlog by socio-economic strata of households is not available. However, the same has been computed for the backlog taking guidance from NSS (38th Round) household consumer expenditure survey, 1983. The shelterless households living in kutcha houses can be taken

URBAN HOUSING BACKLOG

(AS ON 1.3.81)



as belonging to Economically Weaker Sections. Households not having separate room may be taken as Low Income Group households. Bulk of the households living in houses to be replaced on account of obsolescence can be assumed to belong to Middle Income Group. High Income Households requiring major repairs/replacements to their dwelling units taken as ranging between 16 and 20 per cent. The socio-economic reclassification of the backlog of housing shortage as on 1-3-81 has been estimated as follows :

Socio-Economic Strata of Households

	million
(1) Houseless	0·2
(2) Economically Weekes Sections . .	3·1
(3) Low Income Group Households . .	1·4
(4) Middle Income Group Households .	1·0
(5) High Income Groups	0·2
TOTAL	5·9

CHAPTER V

METROPOLITAN HOUSING SCENARIO

49. The metropolitan areas differ from the rest of the urban area in terms of both nature and magnitude of the housing problem. There were 12 metropolises in 1981 as against only one in 1901. The metros have each population of 10 lakhs and above. Therefore, over time, cities with larger agglomerations of population qualify themselves to become metropolises. The number of metropolitan areas, therefore differs from census to census. The number of metropolitan areas and the population thereof for the last four census years are indicated below. The number of metropolitan areas increased from 5 in 1951 to 12 in 1981 and the population recorded an increase of 261 per cent during the period. The population of the 12 metropolitan areas of 1981 was 15.92 million in 1951. By 1981, it rose to 42.12 million which meant an increase of about 165 per cent.

Number of Metropolitan Cities & Population

	1951	1961	1971	1981
1. Metropolitan cities	5	7	9	12·00
2. Population (million)	11·66 (15·92)	17·85 (21·37)	27·42 (29·80)	42·12

Note.—Figures in brackets indicate population for the 12 metropolises of 1981.

50. The following table shows the metropolitan areawise details of population, households etc., as per the 1981 census :

Population and Other Details of Metropolises, 1981

Metro U.A.S.	Population	No. of House-holds	No. of occupied Houses	Households without a separate house	Houseless households
(1)	(2)	(3)	(4)	(5)	(6)
1. Hyderabad	2545836	433640	412802	20838	2535
2. Ahmedabad	2548057	431677	469188	2489	1355
3. Bangalore	2921751	522369	515599	6770	5700
4. Bombay	8243405	1624535	1590575	33960	25095
5. Nagpur	1302066	234616	226444	8172	1435
6. Pune	1686109	322998	311028	11970	1720
7. Jaipur	1015160	184425	183740	685	685
8. Madras	4289347	834288	822216	12072	2035
9. Kanpur	1639064	305882	300690	5192	155
10. Lucknow	1007604	183010	172133	9877	785
11. Calcutta	9194018	1746839	1721143	25696	18060
12. Delhi	5729283	1133171	1017754	115417	15149
TOTAL	41121700	7997450	7744332	253118	74709

Source : RGI—1981 Census (Unpublished data)

The metropolition population and households formed 26.37 per cent and 27.29 per cent of the corresponding total urban figures in 1981. The number of occupied residential houses in 1981 was 7.7 million compared to 5.1 million in 1971. The excess of households over available housing stock works out to 0.25 million in 1981 as against 0.79 million in 1971. This appears to be a healthy sign in so far as number of households without separate house declined over the decade. This could be attributed to larger construction activity during the decade. Out of the 2.53 lakhs households without separate house, 0.75 lakh households or 29.6 per cent were totally houseless or shelterless. Therefore, in order to accommodate the shelterless households, 0.75 lakh housing units are required.

51. Percentage distribution of households by availability of rooms in the dwellings metropolitan city-wise is shown in the Table at Annexure-I. It is clear that households living in a single room varied from 37.30% in Hyderabad to 67.29% in Bombay. Congestion or over crowding appears to be worse in the metropolitan cities than in other urban areas. The 1981 census as pointed out above

had gone by the household approach instead of the house approach in regard to types of structures, amenities, etc. About 9.5 per cent of the total metropolitan households numbering 6.9 lakhs were living in kutcha houses which were estimated to be 6.70 lakhs in number. A kutcha house should be taken as an anachronism in a metropolitan area. Such houses need upgradation in order to be habitable and more importantly to fit in the overall metropolitan situation. Semi-pucca houses which housed 16.8 per cent of the total metropolitan household in 1981 also would need partial upgradation. On the whole, 73.7 per cent of the total metropolitan households lived in pucca houses in 1981. Need on account of replacement of kutcha houses works out to 6.70 lakhs.

52. Another phenomenon observed in the metropolises is the considerable extent of rental housing though house ownership also had gone up from 23.72 per cent in 1971 to 41.47 per cent in 1981. Not withstanding the great increase in construction of dwellings in metropolises, about 58 per cent of the households lived as tenants. A rough estimation of housing need could be on the assumption that every tenant would like to have a house of his own. But since it is not unlikely that some of the tenants own a house or site at the place of work or elsewhere, estimation based on this assumption could be misleading.

53. In metropolitan areas, drinking water supply, electricity and toilet facilities are of even greater importance than, perhaps in small urban places. About 60 per cent of the households had drinking water facility within the premises compared to 52 per cent of the households in the overall urban areas. Electricity facility had been available to 70.9 per cent and toilet facility to 72.5 per cent of the metropolitan households as per the 1981 census. It would also appear that tenants were better placed than the house owners in regard to enjoyment of these facilities as revealed by the following table :

Percentage of households by availability of electricity and toilet facility

URBAN

Metro towns/U.A.s	Electricity			Toilet		
	Total	Owners	Tenants	Total	Owners	Tenants
1. Hyderabad	71·7	67·6	75·1	69·6	63·5	74·5
2. Ahmedabad	75·8	82·6	70·5	73·9	82·1	67·7
3. Bangalore	72·3	66·6	75·4	56·3	64·7	52·2
4. Bombay	77·6	72·7	80·3	73·4	70·7	75·1
5. Pune	76·1	66·2	80·8	59·9	53·4	66·9
6. Nagpur	69·8	68·5	71·2	68·6	60·9	72·3
7. Jaipur	78·6	70·3	90·5	75·1	71·9	87·6
8. Madras	65·4	56·0	71·1	69.7	55·0	78·6
9. Kanpur	62·5	56·8	65·0	63·7	57·4	66·5
10. Lucknow	66·8	65·8	68·7	65·6	63.4	70·0
11. Calcutta	62·9	59·8	64·9	86·0	83·4	87·6
12. Delhi	75·1	69·9	80·5	68·2	62·1	74·5
TOTAL	70·9			72·5		

54. The kutcha houses were mostly located in slum areas of the metropolitan cities. An estimated 18.75 per cent of the urban population was living in slum areas and 43.27 per cent of the total slum population was concentrated in metropolitan areas. Considering the metropolitan areas exclusively, slum population in such places worked out to 30.78 per cent of the metropolitan population. In other words, nearly 1/3rd of the metropolitan population was living in slum areas as in 1981. In short, the problem of metropolitan areas appears to be one of slum clearance, or environmental improvement, upgradation of dwellings in those areas and provision of amenities like electricity, water supply and toilet facilities.

55. The metropolitan housing needs as in 1981 can be summed up as follows :—

Components	Number (000's)
(i) Shelterless households .	75
(ii) Households without separate house (overcrowding)	178 (excluds house loss households)
(iii) Kutcha houses . . .	671
(iv) Obsolescence (4·2% as in the case of urban stock)	325
TOTAL . . .	1249

CHAPTER VI

URBAN HOUSING NEEDS IN PERSPECTIVE

56. So far the housing needs have been estimated in a stationary setting as in 1981. In this chapter, it is proposed to examine urban housing needs in the dynamic context—how they have progressed till 1986 and how they are likely to behave by the end of the century. Estimates have been attempted as on 1st March, 1986, 1991, 1996 and 2001. The factors to be considered broadly remain the same as for estimation of housing needs: but the time element is the new dimension. The crucial factors for projecting housing needs, supply, and gap are (i) rate of household formation and (ii) net rate addition to housing stock. The difference between the two indicates the gap or unsatisfied demand.

57. Projections of urban population for the relevant years have been made by the Expert Committee on Population Projections of the Registrar General of India and reported in the Seventh Five Year Plan, Planning Commission. Since it is number of households rather than population that is relevant in the context of estimation of housing needs, the number of households in the different years have been calculated. One simple method of estimating the number of households in the different years is to divide the projected population by the average size of the household. It is, however, not very correct to assume that the size of the household would remain the same in the coming two decades. Therefore, projection of households based on the past trends of household formation assuming linear growth rate has been attempted for the present analysis.

58. In regard to shelterless households also linear projections have been made. It would not be realistic to presume that shelterlessness would be wiped out in the absence of any large scale measures on a countrywide basis to rehabilitate them. If they are rehabilitated, the projected gap would narrow down to the corresponding extent. In other words, there would be addition to housing stock.

59. For estimating housing stock also a linear growth has been assumed and projections made. Adjustment has been made for acceptable housing stock. It has been assumed that, in keeping with the past trend, construction of kutcha houses as percentage to total would decline by 1 per cent in every quinquennium. The projections are shown below :—

Urban Housing Projections

(As on 31st March) (In millions)

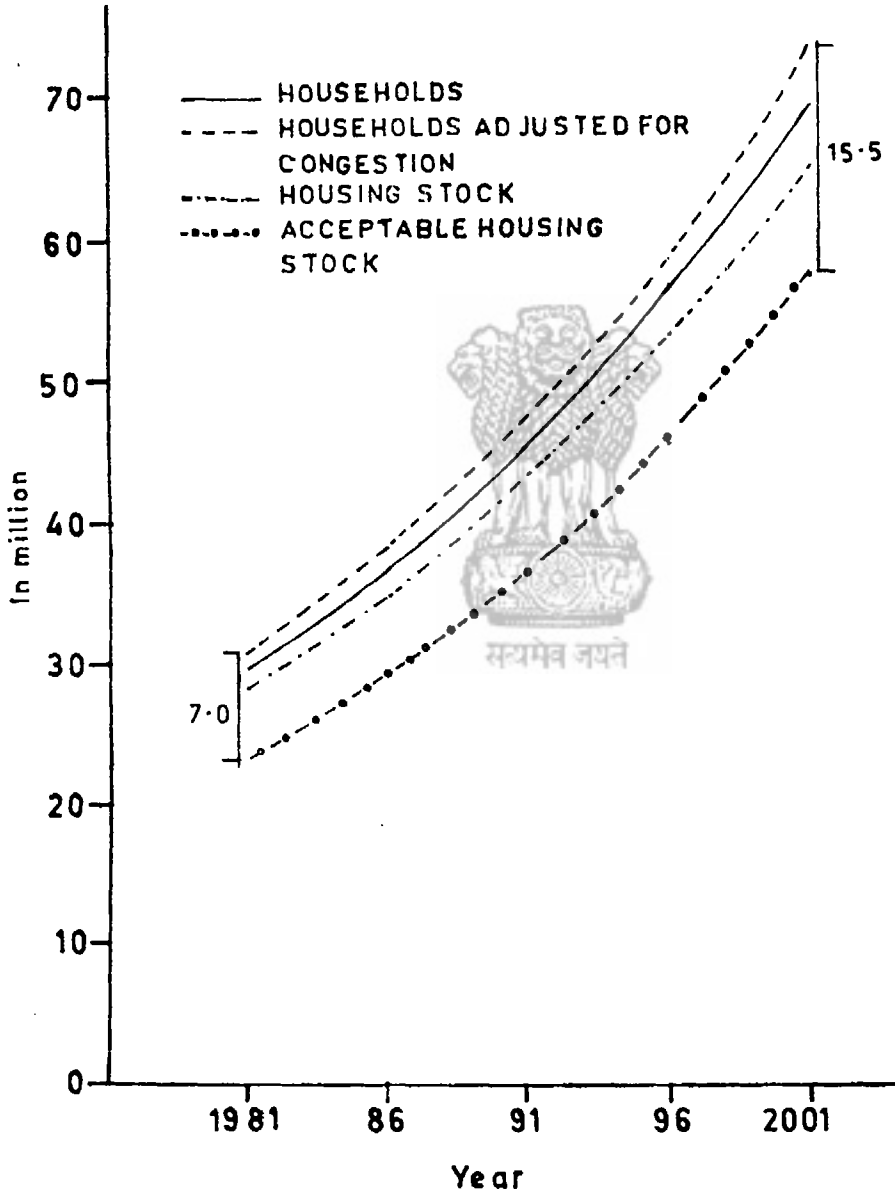
1981	1986	1991	1996	2001	Year
29·3	34·4	39·5	44·6	49·7	Urban Households
28·0	32·8	37·5	42·3	47.0	Housing Stock
23·4	28·0	32·6	37·4	42·2	Acceptable Housing Stock
5·9	6·4	6·9	7·2	7·5	Housing Gap

60. Requirement on account of obsolescence and requirement of dwelling units for involuntarily doubled up couples has been taken as a constant factor while making projections. To clear the large backlog special massive efforts need to be made and construction at all levels and by all the concerned agencies/sectors should be given a boost.

61. It has been observed that households had been increasing at the decennial rate of 53.4 per cent while rate of construction went up at the rate of 51.4 per cent during 1971-81. The difference is 2 per cent which, in absolute terms work out to 3 lakh houses in every 5 years. But if we take into account only houses of acceptable standard, the difference works out to 5 lakhs. The additional number of dwellings to be constructed annually, therefore, would be 1 lakh. This is not an unmanageable gap and can easily be expected to be bridged with the expected boost to housing activity from Government as well as from Institutions. It has been observed that the co-operatives have been adding around 40,000 houses per annum and construction by Govt., public undertakings and organised sector also has been increasing. Therefore, by means of direct construction by institutions as well as provision of financial assistance, construction activity can be expected to gain momentum and the gap between current needs and supply would be nearly bridged. One should however, hasten to add that the building cost has been showing rising trend. Building materials and labour are becoming costlier year after year. How effectively these are controlled/stabilised would determine the practicability of wiping out the housing deficit.

41

URBAN HOUSE HOLDS & HOUSING STOCK PROJECTIONS (1981-2001)



CHAPTER VII

REQUIREMENT OF BUILDING INPUTS

62. What would the backlog of housing mean in terms of requirements of needed inputs, namely, land, materials, labour and money ? The same is attempted in this chapter based on the NBO's concept of urban shelterhouse. The details of calculation are given below :—

Input Requirements

Input	Unit	Approx. Total Requirements	Remarks
1. Land	(000 Hectares)	228	On the basis of 35 sq. m. pe dwelling unit.
2. Key Building Materials			
(i) Cement	Million tonnes	15	
(ii) Steel	Million tonnes	1	
(iii) Bricks	Million numbers	60,000	
(iv) Timber	Million cubic metres	6·50	
3. (i) Labour	Million man-years		Man year is based on 273 days per year.
(ii) Skilled	,,	1	
(iii) Unskilled	,,	1·2	
4. Finance	(Rs. crores)	11,700	

63. The concept of urban shelter house, cost per unit together with material and labour required for each house, specifications and design of shelter house are explained below.

64. **Concepts**

Under the prevailing constraints of resources, the concept of shelter house is to provide roof over the head with such bare essential accommodation as necessary for healthy living and sanitary environments.

The plinth area provided in each house is 17.44 m^2.

For fulfilling the basic needs of an average size of a family of five members, a provision of two covered spaces in the form of one living room and another multi-purpose room is provided, as per the following dimensions.

Living room 2.88 m × 3.16 m (9′-5″ × 10′-4 1/2″)

Multipurpose room 2.88 m × 1.66 m (9′-5″ × 5′-5″)

W.C.-cum-bath 0.90 m × 1.66 m (3′-0″ × 5′-5″)

(Open to sky)

A rear open courtyard has also been provided

65. **Cost**

The cost of each unit is estimated to be less than Rs. 18,000/- as estimated for Delhi on the specification as given in the brochure. The break-up of the cost is as below :—

	Pucca construction (in Rs.)
(i) Total cost	18,000
(ii) Break-up of cost	
(a) Cost of materials	14,500
(b) Cost of labour	3,500
Skilled labour	2,500
Unskilled labour	1,000

This does not include cost of land and land development.

66. **Urban shelter house—specifications**

(a) FOUNDATIONS

(i) Lime concrete with brick aggregate in lime mortar 1 : 1 : 1 (1 lime putty : 1 flyash : 1 fine sand), 150 mm thick.

(ii) II class burnt brick masonry in cement mortar 1 : 6 (1 cement : 6 fine sand).

OR

II class burnt brick masonry in lime-surkhi-sand mortar 1 : 2 : 8.

OR

II class burnt brick masonry in cement-lime-surkhi-sand mortar 1 : 2 : 9.

(b) SUPERSTRUCTURE

(i) II class burnt brick masonry (minimum strength of bricks 70 Kg^2) in cement sand mortar 1 :4.

(ii) Pointing in 1 : 3 cement sand on exterior faces plaster in cement mortar 1 : 6 on internal faces.

OR

Plaster in lime-surkhi-sand mortar 1 : 2 : 8 on internal faces.

(c) WOODWORK

(i) Secondary timbers for doors and windows.

(ii) Frameless doors fixed with M.S. flat lintels.

(iii) Windows with chowkhats.

(iv) Painting for doors/windows with two coats of paint over a coat of primer.

(d) ROOFING AND INTERMEDIATE FLOOR

(i) Precast R.C. Channel units 300 mm wide.

(ii) Joints filled with in-site cement concrete 1 : 2 : 4

(iii) Fan hook in each room.

(e) FLOORING

(i) 25 mm thick 1 : 2 : 4 cement concrete flooring over 75 mm thick base of lime concrete with brick aggregate in lime mortar 1 : 1 : 1 in multipurpose room, W.C. and bath.

(ii) Mud Gobri flooring in front room.

(f) SERVICES

(i) Mosaic seat provided with a trap.

(ii) One light point in each room.

(iii) One fan point in front room.

(iv) One switch board in front room.

(v) One fuse board in front room.

67. I. Estimate of Quantity & Cost of Materials (As per Delhi rates in July, 1987) For Pucca Houses.

(A) **Materials**

Sl.	Item	Quantity	Unit	Rate	Amount
				Rs.	Rs.
1.	Cement	45 bags	bag	60	2700·00
2.	Bricks	8500 Nos.	1000	450	3825·00
3.	Brick Tiles	600 Nos.	1000	480	290·00
4.	Steel	150 Kg.	Kg.	6·50	975·00
5.	Mango Wood Planks	0·30 m^3	m^3	2,600	780·00
	Scantling	0·70 m^3	m^3	2,500	1750·00
6.	Brick Aggregate 25mm	4·00 m^3	m^3	100	400·00
7.	Stone Aggregate 20mm	3·00 m^3	m^3	150	450·00
8.	Stone Aggregate 10mm	2·5 m^3	m^3	180	450·00
9.	Coarse Sand	5·0 m^3	m^3	135	675·00
10.	Fine Sand	5·0 m^3	m^3	50	250·00
11.	Bitumen	40 Kg.	Kg.	5	200·00
12.	Paint & Primer	4 Litres	Litre	50	200·00
13.	Shuttering etc.	15 Sq. m.	m^2	30	450·00
14.	Miscellaneous Fitting Doors, Windows etc.			L.S.	500·00
15.	W.C. Seat & fittings			L.S.	250·00
					14,145.00
			Say Rs.		14,500·00

Note : For Semi-pucca houses suitable variations in specifications of materials would have to be made depending upon availability of local material, climatic conditions etc.

(B) **Labour**

Sl No.	Item	Quantity	Rate	Amount
1.	Masons	24 Nos.	60	2,500·00
2.	Painters	1 No.		
3.	Carpenter	7 Nos.		
4.	Electrician/Wireman	1 No.		
5.	Blacksmith	2 Nos.		
6.	Bhishti	7 Nos.		
7.	Mazdoor	52 Nos.	20	1,000·00
				3,500·00

CONCLUSIONS AND RECOMMENDATIONS

The assessment of urban housing needs in the country has been made by NBO on the basis of 1981 census data obtained from the Registrar General of India and on the basis of data from various other sources. It may be mentioned that data on housing through census was obtained by Registrar General of India for the first time in the 1961 census. At the instance of NBO, more data in this regard was collected during 1971 and 1981 census reflecting more on the qualitative aspects of housing situation.

The methodology of assessment of housing needs adopted in this study is similar to the one developed by the U.N. The present assessment is only to be considered as an indication of the housing situation in the country in the absence of housing census which would provide more precise data on housing conditions.

The following are suggested for the consideration of the Commission :—

(a) Precise data regarding housing needs and shortages and projections thereof, are pre-requisite for evolving appropriate strategy for tackling the housing problem. Suitable arrangements therefore may have to be made for obtaining data on housing conditions. The possibility of conducting housing census may have to be considered.

(b) The data on the rate of new housing construction and current construction activities is being collected by NBO on the basis of a 3 tier scheme. However, it is necessary to ensure continuous flow of information from various sources for which the statistical scheme of NBO should be strengthened.

(c) As a complement to this exercise, it is desirable that state Governments and Union Territories also do similar assessment in their respective areas. They may, therefore, be advised suitably.

(d) Until housing census operations are undertaken, the Registrar General of India may be approached to enlarge the scope of collection of data on housing to provide more qualitative details for making more realistic assessment. The National Sample Survey may also be requested to conduct more surveys on actual living conditions.

PROPOSALS FOR STUDIES/SURVEYS

Introduction

Estimation of housing needs can be improved upon and may be made more realistic, if more data both quantitative and qualitative becomes available. The following studies/surveys need be taken which will provide such data. If required funds to the tune of Rs. 20 lakhs could be provided, NBO will formulate specific proposals for these studies/field surveys, provide guidance in undertaking the studies, coordinate the data obtained and prepare consolidated reports etc.

Studies Proposed

(i) **Acceptable types of kutcha houses in different states/regions.**—It may be recalled that in this study broad assumptions have been made in regard to types of structure, namely, pucca, semi-pucca and kutcha. Kutcha houses both walls and roof of which are built of grass, leaves, reeds etc. have been excluded from the available housing stock. Semi-pucca houses which have walls built of bricks, slabs, stones, GI sheets etc. but roof made of thatch, grass etc. or kutcha walls with pucca roof of tiles, zinc sheets etc. have been considered as acceptable and included in the calculation.

We have gone mostly by the materials used in the construction of walls and roof. The type of construction, whether cement is used or how the roof is fixed on the frame have not been considered. These could not be, as information on the same is not available. Inclusion of all semi-pucca structures might amount to some over-estimation of housing stock in the absence of qualitative data.

It has to be recognised that housing has a culture of its own with all its regional differences. Therefore, in order to have correct idea of the acceptable house in this context, knowledge of the region and housing culture and living habits is necessary in order to make a more realistic estimate of housing shortage. Some regional studies on classification of houses into the known categories and estimation of housing shortage based on the same may be necessary.

(ii) **Socio-economic break-up of housing requirements.**—In this study, housing needs have been estimated on a global basis for the urban sector. The break-up of the housing needs has been shelterless households, overcrowding, upgradation of houses, replacement on account of delapidation etc. The break-up of the housing shortage according to the socio-economic classification would be a new dimension which would enable identification of target groups of taking remedial measures.

A sample survey to identify the socio-economic groups not having adequate and satisfactory housing would be desirable. At present, no information at all is available in this regard. Identification of the socio-economic groups wanting in

satisfactory housing would facilitate formulation of specific housing programme for target groups. This would also give a proper idea of the requirement of investment by the Govt. and the role the State has to play in facilitating housing construction in the private sector. The role to be played by financial institutions in providing housing loans can also be clearly understood. This is particularly necessary in the context of the accepted proposal for setting up national housing bank.

(iii) **Problem of shelterlessness.**—The population census gives figures of shelterless population and households. There is no method of getting estimates of these in the inter-censal years. The census defines shelterlessness. It covers all those persons/household living in the open, pavements, platforms, open mandaps etc. They cannot be considered to be living but just existing. Study of the census data reveals that there are shelterless households too and in some cases each household contained as many as 6 members. That means that there are whole families which are shelterless. The estimation of the extent of shelterlessness and enquiry into the socio-economic background, educational level, ways of living, livelihood etc. would throw light on what can be done to solve their problem.

(iv) **Assessment of vacant houses.**—From this study it is clear that there is a serious shortage of urban housing stock. The shortage is likely to increase rapidly unless steps are taken to add to the stock by direct construction by Govt. as well as promotion of construction by other agencies connected with housing. It is ironical that in the face of serious shortage of housing stock a number of houses remain vacant. The census gives certain number of houses vacant at the time of listing. But that does not throw light on why the phenomenon of vacant houses occurs. The problem is even more serious if keeping the houses vacant becomes more widespread and long term phenomenon.

A study to estimate the proportion of vacant houses and the reasons for the same will be desirable in order that necessary steps can be taken by the Govt. to discourage landlords from keeping their houses vacant. Necessary changes in Rent Control Act (if that were standing in the way of full utilisation of available housing stock) can be brought about. Curative steps as are needed to prevent landlords from keeping their houses vacant may be taken. The study can bring to light the various reasons for keeping the houses vacant.

(v) **Assessment of housing obsolescence.**—The cumulative rate of obsolescence has been estimated indirectly at about 4% of the pucca houses. The results of the National Sample Survey conducted in 1963-64 classifying the housing stock by year of construction has been super-imposed on 1981 housing stock and obsolescence has been estimated. This is indirect means of estimating obsolescence.

The National Commission on Urbanisation in their interim report referred to the phenomenon of obsolescence and dilapidation. They attributed this phenomenon to indifference on the part of the landlords because of inadequate rent and absence of revisions owing to obsolete Rent Control Act etc. Apart from want of incentive, the inability of the landlords to affect major repairs to prevent further deterioration of buildings may also be one of the important reasons. A study to estimate, the extent of obsolescence and dilapidation and the reasons for the same would be worthwhile. The study can be confined to some selected metropolitan cities.

(vi) **Assessment of inputs required for meeting housing backlog.**—It may be mentioned that in the Report requirements of major inputs for wiping out the estimated housing shortage have been worked out on normative approach. The urban shelter house advocated by the NBO has been taken as the acceptable affordable norm. The requirements of major inputs including labour have been estimated on the basis of the NBO norm and the total cost has been worked out as per Delhi rates in July, 1987.

There are two broad limitations in the above exercise. One is the assumption of shelter house itself. The requirements of different sections of people will be different. While the need of shelterless households can be met by night shelters, in case of economically weaker sections and slum dwellers shelter houses may be relevant. In addition to this, there is also the need for environmental improvement and provision of basic amenities where such provision on individual dwelling unit basis may not be possible. The second limitation is adoption of a uniform size of plot for construction. This may be different from place to place and region to region.

In order, therefore, to have a realistic assessment of the requirement of inputs which takes into account regional differences and sectoral preferences and capabilities it would be desirable that some regional studies are conducted. These studies can also attempt some refinement in the estimate of housing shortage.

CENSUS CONCEPTS & DEFINITIONS

Building :

A building is generally a single structure on the ground. Sometimes, it is made up of more than one component unit which are used or likely to be used as dwellings (residences) or establishments such as shops, business houses, offices, factories, workshops, worksheds, schools, places of entertainment, places of workshop godowns, stores etc. It is also possible that buildings which have component units may be used for a combination of purposes such as shop-cum-residence, office-cum-residence, etc.

Vacant House :

A Census House is treated as vacant, if, at the time of enumeration, no person is living in it and it is not used for any of the specified purpose, e.g., dwelling, shop etc. If the house is located because occupants are away, it is not treated as vacant.

Census House :

A Census house is a building or part of a building having a separate main entrance from the road or common courtyard or staircase etc., used or recognised as a separate unit. It may be inhabited or vacant and may be used for residential or non-residential purposes.

Census households :

A household is a group of persons who commonly live together and would like to take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. These may be one member households or two member or multi-member households for census purposes each one of these types is regarded as a household.

Occupied Residential Houses :

The figures of Occupied Residential Houses apply to those Census houses actually used on the Census day as residence (dwellings) or residence in combination with other use. The number of Occupied Residential Houses, thus include, besides residential houses, workshops, factories, garages, shops, depots, etc., where one or more persons like watchmen, peons, drivers, attendants, etc., were found to be residing at the time of Census.

Urban :

Definition adopted in the 1981 census—

(a) All statutory towns with a Municipal Corporation, Municipal Board, Cantonment Board or notified town area etc.

(b) All other places with (i) a minimum population of 5,000, (ii) atleast 75% of male working population engaged in non-agriculture and allied activity, (iii) a density of population of atleast 400 per sq. km. (1,000 per sq. mile).

Urban Agglomeration :

Urban agglomeration is defined as one consisting of one or more towns including in some cases villages or parts of a village which can be considered as urbanised and contiguous to the town or towns concerned.

Houseless :

As per 1981 census, persons at the time of census operation living in open mandaps, mandirs, pavements, hume pipes and under staircase were counted as houseless.

Pucca House :

Pucca house is the one of which the predominent materials of wall and roof are as given below :—

Wall.—Burnt bricks, G.I. sheets or other metal sheets, stone, cement, concrete etc.

Roof.—Tiles, slate corrugated iron, zinc or other metal sheets or asbestos, cement sheets, burnt bricks, lime stone, RBC/ RCC etc.

Kutcha House.—Kutcha house includes which have mud, thatch walls and thatch roofs, i.e., walls made of grass, leaves, reeds etc., and roof of similar materials.

Semi-pucca :

Houses which do not fall within the pucca/ kutcha category. Generally, such houses will have either the wall or roof of pucca material.

ANNEXURE—I

Damage to Houses due to floods/cyclones, Landslides etc.

(In lakhs)

Year	Number (in lakhs)	Damage in the States
1971 . . .	24·3	Bihar (7·9) U.P. (7·4) W.B. (6·7)
1972 . . .	9·0	Orissa (4·2)
1973 . . .	8·7	M.P (1) Orissa (1·6) Raj. (1·3) U.P. (1·9) W.B. (0·9).
1974 . . .	7·5	Bihar (4·3) U.P. (0·9) W.B. (1·0)
1975 . . .	8·1	Gujarat (1·2) Orissa (1·4) U.P. (1·1) W.B. (1·3)
1976 . . .	17·5	Andhra (2·1)[c] Haryana (0·8) Punjab (2·8) Tamil Nadu (1·0) U.P. (2·9) W.B. (1·3)
1977 . . .	16·6	Andhra (10·6) Haryana (·8) R j. (1·0) T.N. (0·6) U.P. (0·5) W.B. (0·9)
1978 . . .	25·0	Bihar (3·1) Haryana (·8) Kerala (1·5) M.P. (0·5) R j. (2·1) U.P. (2·0) W.B. (13·6)
1979 . . .	13·7	Andhra (7·4)[c] (Gujarat (1·4) R j. (0·9) T.N. (2·0)
1980 . . .	25·3	Bihar (0·8) Orissa (0·9) U.P. (19·2) W.B. (2·7)
1981 . . .	7·5	U.P. (4·9) Bihar (0·8) Raj. (0·7)
1982 . . .	32·3	Gujarat (3·9) Orissa (16·2) [fc] U.P. (10·2)
1983 . . .	30·6	Andhra (4·6) Gujarat (1·7) Maharashtra (2·9) T.N. (6·1) U.P. (5·2) W.B. (8·6)
1984 . . .	14·2	Andhra (3.3) Assam (1·7) Bihar (2.2) Kerala (1·1) T.N. (1·5) ([c]U.P. (0·9) W.B. (2·6)
1985 . . .	24·3	Assam (1·1)[f] Haryana(0·9) Kerala(4·8)Orissa(1·2) Punjab (3·7)T.N. (6·2)U.P.(5·0)
1986 (Tentative)	19·8	Andhra (4·4) Assam (3·2) Bihar (0·7) Kerala (1·9) Orissa (0·9) W.B. (6·9)

C—Cyclones
F—Floods

ANNEXURE—II

Percentage Distribution of Households and Number of Rooms

Metro Towns/U.A.s	Households	1	2	3	4	5	6	unspecified
1. Hyderabad . . .	..	37·30	30·42	14·72	8·24	3·37	4·11	0·98
2. Ahmedabad . . .	·18	47·91	28·64	10·53	6·42	1·80	2·13	2·04
3. Bangalore . . .	·74	44·61	26·96	12·32	6·75	2·66	2·90	1·56
4. Bombay . . .	1·61	67·29	16·53	6·07	1·90	·54	.50	3·25
5. Nagpur . . .	2·02	44·80	28·36	11·89	4·61	1·78	1·74	4·00
6. Pune	4·80	60·11	16·27	6·44	2·69	0·94	0·87	7·01
7. Jaipur	·07	42·87	27·74	12·92	7·32	3·32	3·88	1·41
8. Madras	..	45·50	29·75	13·08	6·64	2·44	2·23	..
9. Kanpur	·05	51·68	30·20	8·35	4·33	1.49	1·82	1·88
10. Lucknow . . .	·17	41·27	30·13	13·50	7·19	2·81	2,94	1·52
11. Calcutta	·02	55·12	23·64	0·02	4·06	1·35	1·55	3·08
12. Delhi	·08	54·27	25·75	10.86	4·66	1.47	1·33	0·06

Note : Row-wise totals do not add up to 100 because of exclusion of houseless households.

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सत्यमेव जयते

Institutional Arrangements For Conservation of Built Heritage

M. K. Mukharji

NEW DELHI

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सत्यमेव जयते

FOREWORD

1. This is a Report without any pretensions. Conservation is a subject which is a "many-splendoured thing". A few friends may find that some semi-academic issues which exercise the minds of experts have not received the prominence which they deserve. Others may feel that attempt has been made to cover too wide a field. In reality it is the modest effort of an ex-civil servant to put down on paper the results of his observations of the state of the art as it is practised on the ground in India today, note the inter-linkages and to suggest improvements within the accepted framework but also search for a father who would own the baby. I shall be very happy if the National Commission on Urbanisation finds some use for the recommendations made in the Report.

2. I must express my thanks to Mr. Naresh Narad, Secretary, National Commission on Urbanisation for all his help and understanding and unfailing courtesy; to Mr. Amit Sen, Member NCU for his enthusiastic support and advice and to Mr. Cyrus Guzdar, Member NUC for his valuable suggestions.

3. I thank all my friends in the Government of India and the States for their excellent co-operation in giving me information and their time and valuable suggestions and also for the consideration shown to me.

4. Lastly, I thank Mr. M. S. Prasada Rao, Private Secretary, Ministry of Urban Development for his excellent secretarial work and valuable suggestions. Without his support I could not have completed the Report in time.

NEW DELHI

December 7, 1987.

M. K. MUKHARJI

18—329 M of Urban Dev/ND/88


सत्यमेव जयते

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PRINCIPAL RECOMMENDATIONS

1. General—There is need for urgent action on a systematic and sustained basis to protect and conserve our built heritage adopting a broad definition. The active and willing co-operation of a properly motivated citizenry and a political NGOs with pride in our heritage is essential.

[I/2.1, 3]

2. NGOs/amenity groups should have primarily a promotional and educational role.

[III/14.1]

3. The consciousness about conservation has to be created through a long and sustained process of education of people of all ages and at different levels. The subject will have to be suitably built-in in educational curricula from the primary stage upwards.

[I/3]

4. There should be a national consensus on the basic principles to be adopted for making the conservation effort a reality and at the political level there should be an all-Party convention at the National and State levels to take a conscious decision to keep conservation outside the political arena both in the Government and non-Government sectors.

[I/3]

5. A condition precedent for the success of any conservation programme is the existence of the necessary political will.

[I/3.3]

6. There should be a Cabinet Level Resolution both at the Union and State levels spelling out the responsibilities cast upon the different Departments of Government, organisations etc.

[I/3.2, 7.4]

7. Encroachments and unauthorised construction are rampant—there is a strong case for political parties to treat "land grab" as a serious misdemeanour for politicians.

[I/3.3]

8. There should be an understanding among political parties not to politicise urban development or urban management issues. Encroachment on public land should be made a cognizable offence as done in Delhi.

[I/3.3, III/4.9, 5.2, 5.4, 6.3, 9.11, 10.2 & 10.3]

9. In the present conditions in India the main emphasis may have to be on the conservation of precincts at the city level rather than of individual buildings except buildings of exceptional importance and significance.

[I/3.1]

10. The age criterion for buildings may be reduced to 50 years.

[I/8, III/6.6, 9.3]

11. In many cases adaptive re-use of historic buildings and sites may be the most cost-effective and practical way of conserving them.

[I/9, III/7.3, 9.5, VIII/1.4]

12. A Conservation Fund (Revolving Fund) should be created at the Central and State/UT levels.

[III/9.6]

13. Government of India has to assume leadership in urban conservation in the same manner as in the case of protection of the environment.

[IV/1.1]

14. Except for a few Development Authorities and municipal corporations the local bodies function at a very low level of efficiency and are financially very weak. The main thrust in the States has to be in the sphere of formulation and enforcement of development controls under town planning and municipal administration. The Ministry of Urban Development in GOI and the Central T&CPO will have to provide continuous guidance to the States in the matter and also monitor the progress.

[IV/1.1]

15. Government buildings both at the Union and State levels should be located in keeping with proper land use particularly in growing towns to prevent unplanned growth and environmental degradation.

[IV/1.4]

16. The URIS should be implemented more vigorously to provide adequate data base. There should be land use plan for every town in the country.

[IV/1.4]

17. There is need for a national level body which will be the nodal agency for urban conservation. It may be set up by an Act of Parliament after there is an all-party agreement (political) on the basic principles. It may be called the National Commission of Built Environment.

[IV/2]

18. The National Commission of Built Environment may be attached to the Cabinet Secretariat or the Ministry of Environment for administrative purposes but the Commission would advise the concerned Minister direct and not through the administrative Ministry.

[IV/2.1]

19. At the State level the corresponding body will be a high level statutory State Urban Art Commission with the State Urban Development Department as the administrative Department.

[IV/3]

20. There is need for care on the part of Central agencies in inter-acting with States in a federal system.

[IV/4]

21. The FF Project for urban conservation is a path finder. Such Projects should be launched in about a dozen States as early as possible in the interest of a well planned and co-ordinated urban conservation effort. GOI may assist the States in taking up such projects with modest outlays as in the case of Hyderabad.

[III/4.3, 9.1, V/7]

22. Inadequacies in the ASI have been looked into by two Review Committees in the last 25 years.

[III/15.1]

23. In its Report the Wheeler Committee stressed the need for the listing of domestic architecture.

[III/15.2]

24. Till the norms of the ASI are changed and re-orientation takes place with regard to the listing of period architecture and sites, the needs of urban conservation would have to be met mainly by a vigorous enforcement of development controls in town planning and municipal administration.

[III/15.3]

25. The recommendations for the revamping of the ASI and for amendments to be made in the 1958 Act.

[III/15.3]

26. There should be closer co-ordination between ASI and the concerned Government Departments both at the Central and State levels and the effort should be to take maximum advantage of the expertise available in the ASI.

[III/10.2]

27. It should be possible for the GOI and the State Governments to ensure that historic buildings and sites which are in the care of government organisations are properly maintained and the construction of incongruous buildings avoided. This applies particularly to cities of Bombay and Calcutta which have a rich heritage of such buildings.

[III/11.2, 12.2, 12.3]

28. Special efforts need to be made to encourage the disappearing skilled artisans and craftsmen to remain in business for the proper repair and maintenance of historic buildings and sites. This will have to be done both in the ASI and in other Government organisations and special schedule of rates will have to be adopted.

[III/4.6, 17.3]

29. The ASI Manual for Conservation should be revised and a simple Manual on Conservation should be prepared as a hand-book of reference for the State Government Departments.

[III/5.1, 15.3]

30. Incentives will have to be given for the use of appropriate traditional material in the repair and maintenance of historic buildings and sites. This would apply, among others, to **Aaraish** of Rajasthan and **Sandla** of Maharashtra.

[III/3.4, 4.5, 4.6, 10.2]

31. There should be a Conservation Cell in the CPWD and in the Railway Ministry.

[III/17.5, 20.4]

32. There is need for proper urban management in cantonments and military stations.

[III/21.1]

33. To the extent possible military stations may be declared as cantonments for ensuring proper municipal administration and urban management.

[III/21.3]

34. The services of town planners/architects should be made available to cantonments for proper urban planning.

[III/21.3]

35. The National Heritage Projects and the Cultural Tourism Schemes of the Union Department of Tourism are to be commended as being in the interest of conservation.

[III/22.1, 22.2]

36. The passing of the Environment (Protection) Act, 1986 and the involvement of the Ministry of Environment in urban management is a welcome development.

[III/23.1, 23.4]

37. Beaches need to be kept pollution-free.

[III/8.2]

38. One has to envisage urban conservation at three levels with necessary legislative support. [II/4 to 4.3]

39. Close co-ordination between different government organisations in the enforcement of laws supporting conservation is essential.

[II/4.2]

40. Gaps in town and country planning legislation—please see Enclosure H. The Bill prepared by the FF for Hyderabad project may be accepted, *mutatis mutandis,* as the model.

[II/6]

41. Amendments to 1958 Act.

[II/6, III/16]

42. Analysis of Rent Control Act, Urban Land (Ceiling & Regulation) Act, National Building Code, Bombay Repair Cess Act and Land Acquisition Act. [II/7.1 to 7.5]

43. Agency responsible for listing and grading must inspire confidence.

[V/1]

44. Role of NGOs in survey and listing—final scrutiny has to be done by a public authority.

[V/1]

45. Many of the historic monuments/sites not finally listed may still be found fit for conservation in the town planning exercise. Close inter-action between the Development Authority/municipality and the authority in charge of final listing is essential.

[V/1.2]

46. Listing and gradation at the national level may be done by ASI—procedure recommended.

[V/3.1]

47. It will be obligatory on the ASI to furnish full information to the State Government and the concerned town planning and municipal authorities immediately after listing has been done.

[V/3.2]

57. The availability of trained personnel whose services may be utilised for conservation work may be augmented by preparing a list of qualified people including retired hands in the private sector in the disciplines of archaeology, architecture, engineering, town planning, municipal administration and land administration.

[VI/2.1]

58. "Upgrading of houses" is a subject which may be included suitably in the curriculum of training courses. The experience of U.K. in such "upgrading" of historic buildings has been useful and there is scope for it in India also.

[III/12.3]

59. There is very little provision made for conservation in the Plan and non-Plan schemes of the Central and State Governments. Till such time as the non-official efforts gather momentum and a Conservation Fund is built up through donations and other contributions or levies like Repair Cess (in Bombay) the Government agencies will have to play a major role in the funding of the conservation programme. Some suggestions have been made in Chapter IV.

[VII/1.1]

60. Larger percentage of the Plan provision of the Department of Culture in the GOI may be allotted for conservation. The Union Ministry of Environment may take up a few projects for urban conservation on the analogy of Central Ganga Authority schemes.

[VII/1.1(ii)]

61. In the Urban Development Sector of the Plan, the IDSMT should be modified and other schemes introduced in support of urban conservation.

[IV/1.3]

62. There should be devolution of funds from the State Governments to the local bodies on the recommendation of Municipal Finance Commissions.

[IV/1.1]

63. The municipalities must be assisted to become viable bodies which function efficiently.

[IV/1.1]

64. The restoration of the Govind Devji Temple in Jaipur by Hindustan Charitable Trust is a good example of a private Trust supported by a business house stepping into conservation work and such ventures should be promoted.

[III/4.7]

65. There is an element of participation in the urban conservation effort but certain norms of equity and justice have to be kept in mind—kinds of incentives that may be offered to private property owners—in a large number of cases the best solution would be to encourage the owners themselves to conserve and re-use their building.

[VIII/1.1]

66. Possibilities of different kinds of tax relief—income tax is a powerful instrument and can be used effectively through graded exemptions, higher level of exemption being allowed for cash contribution to the Conservation Funds.

[VIII/1.3]

67. Business houses or private charitable trusts adapting well-defined projects for maintenance of historic buildings sites and gardens, fully respecting the "public amenity" aspect may be considered for suitable exemptions in income tax.

[VIII/1.3]

68. Graded exemptions in income tax in the case of historic buildings which are put to adapative "re-use" may be given.

[VIII/1.4]

69. In all cases professional and constructional services must be made available to all types of listed properties whether owned by private, Government or semi-Government agencies.

[VIII/1.5]

70. The Urban Conservation Authority should evolve a code of grants and loans.

[VIII/1.6]

71. Financial institutions like commercial Banks may evolve a scheme for advancing loans to individuals or private institutions for the restoration or repair of historic buildings.

[VIII/1.6]

72. "Transferable FAR" and "non-incentive FAR" may be made use of in appropriate situations.

[VIII/1.7, 1.8]

73. Loan to small industries for making materials which can be used for maintenance of buildings under conservation.

[III/12.3]

74. A systematic plan of action needs to be worked out for the historic monuments and sites in Delhi *which are not* under the protection of ASI or which are not included in any one of the special projects.

[III/13.3]

75. There should be a Restoration Library in the Eastern Region Cultural Centre to be set up in Shanti Niketan (West Bengal).

[III/12.3]

76. There is need to have a house-to-house survey in the Varanasi Ghats.

[III/5.8]

77. The State Government of Andhra Pradesh should expedite decision on certain recommendations made in the Ford Foundation Report on amendment of legislation.

[III/9.8]

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CHAPTER I

THE BACKGROUND

1. Conservation of built heritage is a limited area in a much wider field covered by the word 'heritage' which would include not only man made objects of brick and mortar or arts and crafts, or music and painting or carved wood and carved stone or silk and textiles or jade and pottery but also hills and dales, forests, beaches and wild life—in one word environment. So far conservation of built heritage was looked upon essentially as an exercise in the proper protection of archaeological finds, ancient monuments representing old civilisations, ancient excavation sites etc. This was a very worthwhile exercise made in the interest of research and learning but it did not go far enough in taking care of the tremendous onslaught made by the rapidly increasing pressure on urbanisation nor did it foresee that its limited regulatory framework would prove to be totally inadequate to deal with the problem arising out of increasing environmental degradation resulting from increase in population, unplanned growth of cities, rampant pollution of air and water and inefficient management of civic affairs. The growth rate of urban areas was 38.22 per cent against the overall growth rate of 24.80 in the decade 1961-71. In the following decade 1971-81 the corresponding percentages were 46.4 and 25.0 respectively. In the decade 1981-91 the projected percentage figures are 44.07 and 22.20, respectively. Some metropolitan cities recorded an exceptionally high rate of growth in the decade 1971-81. Bangalore recorded the highest growth rate with 76.67 per cent, while Delhi, Jaipur, Pune, Ahmedabad and Hyderabad recorded 57.09, 59.42, 48.55, 46.31 and 41.72, respectively.

2. There has been a change, however, slow and gradual, in the perception of what constitutes built heritage. There is a realisation particularly among the intelligentia that it is not only the very old monuments representing our ancient civilisation which need to be protected as museum pieces as witnesses of our past greatness but even other buildings belonging to more recent periods of history deserve to be protected as examples of period architecture of historic and/or aesthetic value. Such "built heritage" would included not only historic monuments and sites but buildings of architectural or aesthetic importance, market places, streets, precincts, avenues, landscapes, bridges which have a character of their own and even historic gardens (Reference : Florence Charter : May 1981) : It is important to realise that heritage is a dynamic concept a building of fine architectural design and aesthetic value which is constructed today will become the heritage of our children and grand-children tomorrow and if it is accepted that proper conservation of a building or a precinct includes the conservation of the environs of the building or precint and the degradation of the environs would mean the negation of conservation then logic would demand that proper landuse must go hand-in-hand with conservation. As it happens our Town and Country Planners and Architects were not much in evidence in the conservation exercise till very recently. This may be due to the fact that in the more easy-going and spacious days the threat of extinction or degradation to such buildings and precincts which were not under the protection of the ASI or some State agency was not very urgent or serious. But in the last 2—3 decades with rapidly increasing pressure on land particularly in urban areas and increase in real estate prices the real estate developers, often an unscrupulous tribe, have been active throughout the length and breadth of the country much to the detriment of the effort to conserve historic buildings and place and damage has been increasing from year to year. It is not without reason that Sir Angus Sterling the Director General designate of the British National Trust who visited India in May 1983 said in his Report that he could very well see the prominent and beautiful landmarks of colonial architecture in Bombay disappearing within a decade as a result of "commercial greed". Evidence of such greed or philistinic action resulting in the destruction, degradation, destruction or mutilation of historic buildings and precincts in other parts of the country including Delhi, Calcutta, Madras can be easily multiplied.

2.1 There is therefore no doubt that urgent action on a systematic and sustained basis requires to be taken to protect and conserve our built heritage adopting a more broad-based definition as explained above. No conservation programme can succeed without the active and willing co-operation of a properly motivated citizenry. While Government, both at the Union and State levels, has to take determined, effective and imaginative regulatory measures the people, through a political and dedicated non-Government Organisations, academic institutions etc., must provide support for the government policies and programmes and also carry the message to the remotest corners of the country.

3. The mobilisation of public opinion for an effort of this kind is not easy. The desire to conserve the built heritage can be created in either of two ways :—

(a) it can flow from the broader consciousness of the community about environment, aesthetic surroundings and "better living"—a phenomenon which is to be found in most economically developed and opulent societies ; or

(b) such consciousness has to be created through a long and sustained process of education about the nation's past and creation of pride in one's heritage. In the latter situation the leadership and inspiration have undoubtedly to be provided, with Government support, by the intelligentia, if the word "elite" is to be avoided.

But for such an effort of education to succeed it is essential to have a proper atmosphere in which there is no credibility gap and the people do not feel that conservation is high flown culture and is the monopoly of the rich and the privileged and the people are only the drawers of water and the hewers of wood. In India the main effort would have to be of the second category and the programme of education and orientation would have to cover people of all ages at all levels starting from the primary school upwards. The idea will have to be built in an appropriate manner in the text books of the educational institutions and in the extra curricular activities of the school and college going children in the shape of sponsored excursions, debates, essay competitions, awards for "social" work in the listing of historic buildings, monuments and places and prevention of vandalism etc. Non-Government Organisations in the form of registered societies will have a vital role to play in organisation, the movement and developing it on proper lines. Where necessary government assistance may be given to such NGOs on the basis of clearly defined and objective criteria which should be result-oriented and strictly non-political. In fact for any meaningful effort to be mounted to create a sense of pride in one's heritage and in the proper conservation of such heritage, it will be essential to cultivate a national flavour in the whole approach irrespective of caste, community, religion or region or political party considerations. There should be a national consensus on the basic principles to be adopted for making the conservation effort a reality and a all-party convention at the national and state levels may take a conscious decision to keep the conservation programme outside the political arena both in the government and non-government sectors.

3.1 In the present conditions in India the main emphasis would, for sometime to come, have to be on the conservation of areas and precincts and at the city level rather than of individual buildings except of course, buildings of exceptional importance and significance. For this it will be essential to fully orient the Town and Country Planners and Architects to the task and make the fullest use of the Town & Country Planning Organisations in drawing up master plans, development plans, zonal plans and zonal regulations giving conservation its rightful place in the exercise. This will of course have to be preceded by a preliminary exercise in the identification of the buildings, areas and precincts to be conserved.

3.2 A clearer definition and delineation of departmental responsibilities and avoidance of overlapping functions and adequate funding in the five-year and annual plans would also have to be ensured. A Cabinet level Resolution both at the Union and State levels spelling out the responsibilities cast upon the different departments and government organisations, development authorities and local bodies (municipalities) will help in presenting a clear picture of the effort required to be made by government and instil confidence in the functionaries for proper discharge of their role and responsibilities. In drawing up Resolution and making the structural arrangements government would no dobut avoid pitfalls and the weaknesses experienced in the working of the Pollution Control Boards and place responsibility and accountability in clear terms on the shoulders of full time functionaries with professional competence.

3.3 A condition—precedent for the success of any conservation programme is the existence of the necessary political will in support of a sustained effort. One may be tempted to think that in India the long established operations of an expert and prestigious body like the ASI have created an atmosphere in which an expanded conservation programme will receive the passive acceptance of the political elements as something which is quasi-academic. Such optimism would have been justified if the expansion were to be only in respect of ancient buildings and excavation sites. Once the rigours of the development controls are brought to bear on the "haves" in the city the apple cart of the local politician is bound to be upset and he will exert all his influence to nullify the regulations overtly or in a covert manner. It is then that a strong public opinion and an enlightened government support will have to come to the rescue of the conservation programme. One has only to look at the unauthorised jhuggi-jhompri settlements, the numerous encroachments and the unauthorised constructions in towns and cities—mostly backed by the local politicians—to appreciate the correctness of the statement. It can only be hoped that the open and brazen violation of law which prompted Government in Delhi to amend the municipal bye-laws in 1983-84 to make encroachment of public land a cognizable offence, will decrease

with the acceptance of the conservation programme through political consensus. The analysis of the position in some States as given in a succeeding chapter will show that encroachments and unauthorised constructions are rampant and there is a strong case for the political parties to treat involvement in "land grant" activities as a serious misdemeanour for functionaries at all levels including Ministers. There should also be understanding between the principal political parties not to politicise urban development or urban management issues. A recent regretable instance is the controversy over the redevelopment of Rawdon Square in Calcutta.

3.4 Outside India, most countries of the world have been increasingly drawn towards the conservation of the built environment in the course of the last half-a-century and in the last decade the trend has been to formally widen the concept to include different "amenities" like historic gardens (Florence Charter : 1981). The landmarks in the international conservation movement are :

(i) The Athens Charter of 1933;

(ii) The Venice Charter of 1964;

Article I of the Chapter contains the following definition :—

"The concept of an historic movement embraces not only the single architectural work but also the Urban and Rural setting in which is found the evidence of a particular civilisation, a significant development or an historic event."

(iii) The Florence Charter (May 1981) on Historic Gardens and Sites.

The ICOMOS (International Council on Monuments and Sites) has been active in promoting understanding of the subject and the UNESCO has also come forward to assist the programme of the different countries in various ways.

4. Most of the Western countries and the USA have well established bodies to promote conservation of the built environment. Other countries like Canada and Australia have also set up national level agencies for the purpose. USSR has also taken positive steps for the conservation of its rich heritage in the different ethnic areas and has taken special care to build up technical expertise for taking care of historic monuments and period architecture.

5. Among the Asian countries Japan has a well organised system of administration of cultural affairs mainly through the Agency for Cultural Affairs (BUNKACHO). It will be useful to dwell a little on the details. There is a Law for the protection of cultural properties. BUNKACHO was established in 1968. It is headed by the Minister of Education, Science & Culture. Below him is the Commissioner for Cultural Affairs who controls a number of Internal Departments, Facilities and Institutions and has certain Advisory Council. The Internal Departments include the Cultural Affairs Department, the Cultural Properties Protection Department, (sub-divided into Monuments and Sites Division, Architecture Division, Fine and Applied Arts Division and others). Under Facilities and Institutions are included the National Museums, Japanese Art Academy, the Nara National Research Institute of Cultural Properties and the Tokyo National Research Institute of Cultural Properties, among others. There are four Advisory Councils of which one is for the protection of cultural properties. Only one institution i.e. The National Theatre comes under Special Institutions.

5.1 The State-Designated Cultural Properties include Fine and Applied Arts (pictures, sculptures, applied art works, calligraphic works and others), archaeological specimens and historical material. They are categorised at National Treasures and Important Cultural Properties according to their importance. Under archaeological specimens there were 36 National Treasures and 394 Important Cultural Properties as of February 1985. Protection of buildings and other structures designated as Important Cultural Properties is an important activity and from 1965 onwards the identification of such structures has been going on. The types mentioned are Shinto architecture, Buddhist architecture, castles, forts, dwellings, Western style structures, private houses, stone monuments, bridges, etc. The present number identified is 3,189. As much wood is used in these structures they are in need of continuous repair and maintenance work. Government assistance is also available for architectural structure preservation to owners who reside in those dwellings and are significantly inconvenienced in their every day living by restoration efforts and other preservation management. There is provision for purchase of cultural properties in appropriate cases. There are quite a few post towns, castle towns and farming or fishing villages in which groups of traditional buildings stand in harmony with their surroundings and create an aura of historical association. To take care of such groups of buildings the law was amended in 1975 for the protection of Traditional Building Group Preservation Zones and Government assistance is available to the municipalities for preservation of such cultural properties. Japan has also a highly organised training system covering personnel of different disciplines and at different levels. Besides participating in the ICCROM training course the Agency for cultural Affairs organises a variety of training seminars and study conferences etc. Some of the courses are—

— Lecture course on Basic Art and Cultural Administration.

— All Japan Voluntary Cultural Properties Protection Study Assemblies.

— Cultural Properties Administration Course.

— Training Course for Historical and Ethnic Materials Specialists.

— All Japan Important Cultural Properties, Architectural Structure, Preservation and Repair Chief Technicians Liaison Conferences.

6. It would be interesting to note the experience of another country, namely, Australia which has a federal system of Government. A Committee of Inquiry into the National Estate submitted a Report to the Federal Parliament in August 1974 recommending the establishment of a national body to be concerned with national policy and co-ordination with reference to the conservation of the National Estate. The recommendation was accepted and Australian Heritage Commission Act was passed in June 1975 with full support of all political parties and the first Commission was appointed in July 1976. The Commission is a very high level body consisting of individuals of eminence who have distinguished themselves in their own field of activity—they may be scientists, academicians, jurists, administrators, etc. The main function of the Commission is to prepare a Register of National Estate Places, advise the Minister for Arts, Heritage and Environment on all matters related to the National Estate and develop policies and programmes for research, professional training, public interest and undertaking and education. It is also responsible for administering any gifts and bequests made to the commission. Though the Commission has no power over the actions of State or local governments or private owners it must be informed of and given time to comment on any government action that might significantly affect a place entered in the Register of National Estate places. A detailed procedure is laid down for listing of places by the Commission and normally government is not expected to interfere with the decisions of the Commission though the Minister has the power after considering an Environment Report (an inquiry conducted under the terms of the Environment Protection Act) to direct the Commission to enter or not enter a place in the Register or to remove a place from the Ragister. There are more than 6,600 National Estate listings. In a Review Report on the activities of the Australian Heritage Commission some of the interesting points made are :—

— The Commission's work has depended largely upon Australia's voluntary conservation bodies which include several State level National Trusts;

— Several nature conservation bodies and National Trusts (private bodies) have been active in the conservation work;

— There is a growing number of specialist professional organisations in conservation work;

— Support to the Commission from government agencies has been very good.

6.1 The Commission has also a comprehensive series of research projects and a very successful and popular product of the Commission is the school-kit "Investigating the National Estate". A film called "Things that we want to keep" made by the Commission is also very popular.

6.2 The Report however mentions that the Commission had to meet rough weather for the first five years and there were constant attacks from some quarters. A few people believed that the Commonwealth Government should not concern itself with the conutry's heritage. However the Commission seems to have crossed the hump and its standing is now well established. There is a comment in the Report that the task of the Commission was very imperfectly understood by many people and that may have been the reason for the attacks against the Commission. While appreciating the efforts made by the voluntary bodies for carrying out listing or classifications the Report says that sometimes the bodies found it impossible to devote resources to thorough documentation and in such cases the Commission had to organise lengthy and expensive studies to correct or improve the documentation. According to the Report the National Estates Grants Programme under which money is allocated for up-keep of the National Estate and for grants to voluntary conservation bodies has been less than adequate and it constitutes no more than 1 per cent of the total cultural spending in Australia.

6.3 So far as institutional arrangements go the Australian experience is of some relevance for India which also has a federal system of government.

7. It is very well known that in the postworld war II years many countries in their task of reconstruction and restoration of cities kept the norms and ideals of historic buildings and places very much in view and took great pains to retrieve old drawings in order to ensure faithful reconstruction or restoration of damaged buildings. This happened not only in the Western countries like West Germany but also in countries in the Eastern Block like Poland.

8. In the context of the widening of the concept of conservation and adopting a very comprehensive view one can say that today urban conservation has to be looked at not only at the level of historic buildings but also at the level of precincts, places, groups of buildings, avenues etc. and also at the level of the city. Side by side the idea of adaptive re-use of buildings and sites and the sense of belonging are

also very important. In the conservation strategy in India it may not be practicable to give high priority to purchase of privately owned historic buildings and sites on a significant scale and an appropriate phasing may have to be adopted for reasons of financial constraints but it should certainly be possible to ensure the effective implementation of development controls in town planning and municipal administration to satisfy the broad requirements of conservation. We will also have to seriously consider the reduction of the age criterion from 100 years to say 50 years both at the national and state levels. There is also considerable scope for adaptive re-use of historic buildings and sites and in many cases this may be the most cost-effective and practical way of conserving historic buildings and monuments. Buildings which are in the nature of "National Treasure" will, of course, have to be treated differently.

CHAPTER II

CONSTITUTIONAL AND LEGAL POSITION

1. For a proper appreciation of the responsibilities cast on the Union and the State Governments in a federal structure like ours, it is necessary to state briefly the relevant provisions in the Constitution. Thereafter one could go on to examine the adequacy or otherwise of the existing laws—

(a) to discharge the obligations laid down in the Constitution; and

(b) as effective tools in the hands of the different agencies of Government to deliver the goods.

1.1 According to Article 49 of part IV of the constitution which deals with the Directive Principles of State Policy, an obligation is placed upon each State "to protect every monument or place or object of artistic or historic interest, declared by or under law made by Parliament to be of national importance, from spoliation, disfigurement, destruction, removal, disposal or export, as the case may be." As regards legislative competence to enact law for protection of monuments and sites the following are the relevant entries in the Lists contained in the Seventh Schedule to the Constitution.

Entry 67 of List I (Union List).

"Ancient and historical monuments and records and archaeological sites and remains, declared by or under law made by Parliament to be of national importance."

Entry 12 of List II (State List) :

"Libraries, museums and other similar institutions controlled or financed by the State, ancient historical monuments and records other than those declared by or under law made by Parliament to be of national importance".

Entry 40 of List III (Concurrent List)

"Archaeological sites and remains other than those declared by or under law made by Parliament to be of national importance".

2. In a well-known reported case—Joseph Pothen Vs. States of Kerala (AIR 1965 SC. 1514) the Supreme Court clarified the legal position thus :

"It will be noticed that by reason of the said entries (in the Lists of Seventh Schedule) Parliament could only make law with respect to ancient sites and historical monuments and archaeological sites and remains declared by Parliament to be of national importance. Where Parliament has not declared them to be of national importance, the State Legislature has exclusive power to make law in respect of ancient and historical monuments and records and both Parliament and the State Legislature can make laws subject to other Constitutional provisions in respect of archaeological sites and remains."

3. The idea of a monument of national importance was introduced for the first time in law by the Ancient and Historical Monuments and Archaeological Sites and Remains (Declaration of National Importance) Act, 1951 which was enacted by the Parliament in fulfilment of Constitutional provisions and by which all monuments protected under the Ancient Monuments Preservation Act, 1904 in Part A States were re-declared as of national importance. About 450 monuments and sites in Part B States were included in the national list. Thereafter came the Ancient Monuments and Archaeological Sites and Remains Act, 1958 which was broadly modelled on the lines of the Act of 1904 and repealed the Acts of 1904 and 1951. A few new provisions were introduced in the 1958 Act probably in the light of past experience and the need to meet new requirements. They were:—

(a) In the interests of uniformity and integral policy it was proposed to transfer some of the powers conferred on the District Collectors by the Act of 1904 to the Director General of Archaeology.

(b) The Act conferred powers on the Central Government to declare by a notification the ancient monuments or archaeological sites and remains to be of national importance instead of by law passed by the parliament as was necessary under the Act of 1951.

(c) The Act provided that where the owner of a protected monument refused to enter into an agreement the Central Government may make an order for the maintenance of the monument which shall be binding on the owner.

(d) The Act empowered the Central Government to regulate excavations in archaeological sites which are not declared to be of national importance.

(e) Provision was made for the compulsory purchase of antiquities and other objects of historical or archaeological importance on payment of compensation.

3.1 The Archaeological Survey of India has been functioning under the provisions of the 1958 Act. There are two essential ingredients in an ancient monument under the Act :—

(a) the monument must be of historical, archaeological or artistic interest; and

(b) it must have been in existence for not less than 100 years.

Under Section 4(1) of the Act, a "Protected monument" is an ancient monument declared to be of national importance by the Central Government according to Section 2(d) Archaeological site or remains" means an area which contains or is reasonably believed to contain ruins or relics of historical or achaeological importance which have been in existence for not less than 100 years and including portion of the land required for fencing, covering in or preserving it and the means of access. A "protected area" means any archaeological site or remains which is declared by the Central Government to be of national importance.

3.2 The Act empowers the Central Government under Section 4 to declare any ancient monument or archaeological site and remains as being of national importance. In other words, the Government can declare them respectively as a "protected monument" and a "protected area". The proposal for making such declaration would normally emanate from the officers of the ASI but it can also be suggested by a citizen and according to the procedure laid down the Central Government is required, by a notification in the official gazette, to give 2 months notice of its intention to declare the ancient monument and the site to be of national importance. A copy of such notification is to be fixed in a conspicuous place near the monument or the site and any person interested may, within 2 months, object to the said intention of the Government. On expiry of two months the Government may, after considering the objections if any, declare by a notification in the gazette that the monument or the site is of national importance. The procedure for inviting objections from persons having some interest in the property flows from the principle of natural justice but in actual practice all objections received from any quarter are considered on merits by the Government.

3.3 There is no clearly spelt out principle or scientific basis for adopting the minimum time limit of 100 years nor are there any clear-cut criteria for declaring a monument as of national importance. As discussed in the following paragraphs these and a few other inadequacies in the 1958 Act and the 1959 Rules have become somewhat conspicuous in recent years and call for rectification.

3.4 The methods by which the Director General ASI may acquire proprietory rights or custody of a protected monument are the following :—

(a) purchase or take on lease or accept as a gift or bequest, of the monument after getting the sanction of the Government;

(b) by a notification in the gazette assume guardianship of the monument in case where there is no owner and also where the owner himself constitutes the Director General as guardian; and

(c) by compulsory acquisition of the monument.

3.5 Most of the well-known monuments are already in the possession of or under the complete control of the Government but there are others still continuing under private ownership. If the private owners of monuments and sites have been neglecting them for one reason or the other leading to a state of disrepair or ruin it would be the duty of the Government to prevent injury to and preserve these buildings in the interests of the nation. Section 6 of the 1958 Act therefore provides for an agreement to be entered into between the private owner of a protected monument and the Government for ensuring its preservation. The agreement can deal with a wide range of matters ranging from maintenance of the monuments to restriction on the owner's right to use or alter or deface it or to build on or near the monument and also regarding the access facilities to the public and the arbitration procedure in case of disputes. In practice the maintenance expenses are usually paid by the Central Government to the owner. According to the provisions of the Act the expression "maintenance" includes the fencing, covering in, repair, restore and cleansing of a protected monument and the doing of any act which may be necessary for the purposes of preserving a protected monument or of securing convenient access thereto. The Central Government or the owner can terminate an agreement on expiry of 3 years after giving 6 months notice to the other party but in the case of refusal by the owner to enter into agreement for the maintenance of protected monument, the Act confers a drastic power on the Central Government to make a unilateral order providing for any of the matters referred to earlier, after giving an opportunity to the owner to make a representation against the proposed order. Such an order shall be binding on the owner. If the owner who has signed an agreement fails to act which the Director General considers necessary for the maintenance of the monument, the latter can get the work done and recover the expense from the owner.

As the last resort the DG, ASI can acquire the land compulsorily under the Land Acquisition Act, 1894. The invoking of the eminent domain powers of the Government to acquire land compulsorily for purposes of maintenance of protected monuments or areas is done under Section 13 of the Act which declares that the Government may acquire the protected monument or area "as if the maintenance of the protected monument were a public purpose within the meaning of that Act" (i.e. the Land Acquisition Act). Section 23 and 24 of the Land Acquisition Act, 1894 are applicable to proceedings for Acquisition of a protected monument or area. Therefore compensation for the land would have to be based on its market value on the date of section 4(1) notification under the Land Acquisition Act. Even compulsory purchase of antiquities are to be done at their market value.

3.6 Rules 31 and 32 made under the 1958 Act empower the Central Government to declare a "prohibited area" or a "regulated area" near or adjoining the protected monument for the purposes of mining operations or construction after following the prescribed procedure. No person other than an archaeological officer shall undertake any mining operation or any construction in a prohibited area or regulated area, except under a licence granted by Director General ASI. The contents of the Rules would suggest that in the "regulated area" where the development is to be regulated by the Central Government would normally be a larger area than the "prohibited area" where the restrictions are more stringent. However the repeated mention of mining operations gives the impression that the regulation was intended to be a measure to ensure the safety of the monument rather than the regulation of developments in the vicinity of the monument in an urban *setting*. In any case the Rules regarding regulation have rarely been used effectively in actual practice.

3.7 The above analysis would show that the 1958 Act and the Rules framed thereunder have, by and large, provided support to the protection of individual monuments but the provisions of this law do not go far enough to meet all the requirements. Some of the broad objectives in regulating developments in the near vicinity of protected monuments would be the following :—

(a) to ensure that no development whatsoever takes place within a certain minimum distance from a monument;

(b) to see that the monument would not tend to get dwarted due to highrise buildings in the vicinity;

(c) to ensure that the character of development in the vicinity of the monument is in harmony with it and does not spoil its setting; and

(d) the view of the monument from a long distance along some of the existing axis lines should not be affected if it is a dominating type.

3.8 If the relevent legislation does not make it possible to prevent ugly and incongruous structures from coming up near about the protected monument, the harmony and character of the place and the setting of the monument cannot be conserved. An example often cited is the construction of the Municipal Complex adjacent to Jantar Mantar in New Delhi. It was a case of blatant failure of the city planners and the municipal authorities to impose the necessary development controls and enforce proper building bye-laws to protect the interest of this famous monument. It was also a very good example of lack of co-ordination between the ASI, DDA, T&CPO and the NDMC. If adequate space around Jantar Mantar had been kept clear and suitable height restriction imposed in time then the damage would certainly have been avoided.

4. The question arises whether the only position support to the programme of conservation of built heritage is to be found in the 1958 Act and the Rules framed thereunder with certain important amendments or whether it has to be a many-pronged effort by different statutory, government and semi-government organisations finding support in different sets of legislation and working in close co-ordination with one another. This is because conservation has to be looked at three levels, namely:—

— monument level;

— precinct level; and

— city level.

4.1 At the monument level the premier and well established Archaeological Department in the country is the ASI which operates primarily under the provisions of the 1958 Act and the 1959 Rules. As mentioned above there are certain inadequacies in the existing provisions of the Act and one could broadly suggest the lines on which the Act needs to be amended.

4.2 Secondly, for conservation at the precinct level, that is to say for the conservation of places, areas, landscapes going with the overall setting, trees and water bodies etc., one would have to rely on adequate legislation in the shape of development controls in town planning and special Acts and municipal laws and bye-laws etc. The Urban Art Commissions, the Development Authorities, the local bodies (municipalities) would have to play a very positive role and there would also have to be close co-ordination between all the concerned government departments so that the right hand may know what the left hand is doing.

4.3 At the city level the broad concept of conservation of built environment would really find a base in proper urban management as urban degradation would be a total negation of the idea of conservation of the built environment. For proper city management we would not only assume the existence of a viable municipal organisation but also city planning and city management at a minimum acceptable level; the existence of an urban information system and lastly the acceptance of the idea of conservation in the implementation of the land use plans, however rudimentary, in the small towns and strong public opinion against the violation of basic zoning regulations.

5. So far as conservation at the precinct level and city level are concerned though our Town Planning Acts have generally been on the pattern of the planning laws of the UK. during the course of this century and particularly of the Town & Country Planning Act, 1947 of the UK, it is unfortunate that some important features of the English laws relating to conservation of buildings and trees were missed out in our Planning Acts. In the UK the provisions of the Civic Amenities Act, 1967, as far as they referred to town and country planning, were incorporated into the Town and Country Planning Act, 1971. Thus, under Section 277 it is the duty of every local authority to determine the areas of special architectural or historical interest, the character or appearance of which it is desirable to preserve or enhance and it shall designate such areas as conservation areas. An application for development which, in the opinion of the local authority would affect the character or appearance of a conservation area, must be advertised in the local newspapers and displayed on the site for the public to raise objection. The local authority also has the power to exercise control over demolition of any building in a conservation area even if such a building is not listed and in order to assist the local authorities the Government compiles lists of buildings of special, architectural or historical interest and supply the lists to the local authority and the owners and occupiers of those buildings are notified. The legal consequence of listing is that any act causing damage to a listed building is punishable offence. Even if a building is not listed the local authority may issue a building preservation notice which is valid for 6 months during which it could be listed. It is an offence to demolish, alter or extend a listed building without obtaining consent. If a listed building becomes incapable of reasonably beneficial use in its existing state and planning permission is refused the owner may serve a purchase notice on the local authority which will have to either purchase the building or grant permission to develop.

5.1 It would appear that though town planning law is not a new legal tool in India and even in the early part of the twentieth century town planning was recognised as a part of municipal functions the needs of conservation of the built environment or the preservation of buildings of historical or architectural value were not clearly recognised or built into the existing laws. After Independence with the pressure of urban growth the problems assumed greater proportions with regard to scope and complexity and after a review of the existing position it was felt that the Union Government should provide some guidance to the State Governments in town and country planning legislation. According to the Constitution enactment of legislation concerning land and its development is the responsibility of the State rather than of the Centre vide entries No. 5 and 18 of the List II of the Seventh Schedule. The Central Government can enact legislation relating to the control and regulation of development with respect to limited areas such as cantonments, railways, national highways, major ports, posts and telegraphs and other communications and regulation and development of inter-State rivers and river valleys which appear in List I of the Seventh Schedule. Entries 20 and 42 in the Concurrent List however provide for economic and social planning as well as acquisition and requisition of properties. By adopting a liberal definition of economic and social planning it can theoretically be taken to include land planning and control but in practice so far the regulation of land use and its development have been confined only to State legislation. Therefore the enactment of legislation relating to town and country planning which basically leads to the prescription of the use of land and its development has been taken to be a State item and any law in this regard passed by Parliament can have effect only in the territories directly governed by Union Government. Keeping these considerations in mind the Government of India decided to assist the State Governments in the matter by circulating, in the sixties, a model Regional and Town Planning and Development Bill for adoption with suitable modifications to suit the requirements of individual States and Union Territories. The progress has been reviewed from time to time. The State and UT-wise position in the passing of legislation on Archaeology and Town and Country Planning, as in 1985, will be found in the enclosed statement (*vide* Enclosure II). It will be seen that the progress has not been uniformly satisfactory. The 21st meeting of the Central Council for Local Government and Urban Development and the 10th Joint meeting of the Central Council for Local Government and Urban Development and the Executive Committee of the All India Council of Mayors held on the 18th and 19th July 1984 at New Delhi, while considering the progress with regard to the enactment of comprehensive urban and

regional planning legislation in the States and Union Territories, passed the following Resolution :—

> "The Central Council recognises the need for undertaking suitable legislation on urban and regional planning to be passed by all the State Governments and urges upon the State Governments which have not undertaken such legislation to do so at an early date".

5.2 The Town & Country Planning Organisation of the Ministry of Urban Development which had been monitoring the progress of the enactment of legislation in the different States and UTs noted with satisfaction in 1985 that in the National Capital Region all the three member States, namely, Uttar Pradesh, Rajasthan and Haryana and the Union Territory of Delhi had agreed upon the setting up of a statutory Board and Parliament had passed the National Capital Region Planning Board Act in 1985. Though the concept of planning at the NCR level is not of direct relevance to urban conservation the enactment of the NCR legislation is worth noting as an important example of the acceptance of the principle of urban planning at the regional level involving more than one State.

6. The above analysis read with the statement at Enclosure H will show that there are still significant gaps in the town and country planning legislation of some of the States/UTs and urgent action needs to be taken to close the gaps so that they become effective tools in the hands of Urban Conservation Authorities. To meet the full requirements of urban conservation the Town & Country Planning Acts will need to have a provision to prevent demolition and attendent mischief and for this the draft Bill prepared by the Hyderabad Urban Development Authority may be accepted, *mutatis mutandis,* as the Model. Relevant provisions of the draft Bill have been discussed in Chapter III under Andhra Pradesh and the salient features of the draft Bill can be seen at Enclosure E.

Ancient Monuments & Historical Sites & Remains Act, 1958.

Certain lacunae in the Act have been discussed in the foregoing paragraphs in this Chapter and a few amendments to the Act have been suggested both in present Chapter and also in Chapter III under 'Archaeological Survey of India'. The suggested amendments relate primarily to the use of the word "conservation" rather than "preservation" in the preamble to the Act, the need for laying down criteria for "national importance"; the need for adopting appropriate definitions for the terms "monument", "group of buildings" and "site", protection of the environs of the monument in more positive terms; and the requirement of providing for a No Objection Certificate to be given by the ASI on certain points in every proposed re-development project in the vicinity of a protected monument or site of national importance. It is expected that once these amendments are carried out at the national level, the States will soon follow suit with regard to the State level legislation.

7. The other Acts closely connected with urban conservation are the Rent Control Acts, the Urban Land Ceiling Act and the Land Acquisition Act. The following are my comments on them.

7.1 **Rent Control Acts.**—The Delhi Rent Control Act and also the State Acts as they stand today are wholly outdated in some respects and amendments need to be made urgently to "unfreeze" the controlled rent and enable them to be revised in consonance with the operation of economic laws and increase in the cost of repairs and maintenance. It is unfortunate that in spitt of the subject having been thoroughly examined in the Ministry of Urban Development (previously Works and Housing) and certain concrete proposals having been made on the strength of the Report of the L.K. Jha Commission (EARC) the proposals for amendments got shelved apparently for political considerations. As the present provisions of the Rent Control Act are unrealistic there is large scale evasion of the law and landlords indulge in various malpractices like taking of *pugree* etc. It has also severely affected the growth of housing stock in the private sector for rental purposes. For obvious reasons the existing law will also act as an impediment to any programme for re-use of historic buildings for rental purposes either residential or non-residential. It is therefore important that the amendment of the Rent Control Act is pushed through without further delay.

7.2 **Urban Land Ceiling Act.**—This Act which has failed, by and large to serve the purpose for which the legislation was enacted but the impractical and restrictive provisions of the Act have had a negative effect on various aspects of urban development including urban conservation. The Act needs to be amended without further delay.

7.3 **Land Acquisition Act.**—As no serious difficulty has been experienced so far and the Act provides for the proper repair and maintenance of historical buildings and sites to be taken as public purpose there does not seem to be any urgent need for amendments to the Act just now.

7.4 **The Bombay Repair Cess Act.**—Which authorises the Bombay Municipal Corporation to collect "repair cess" (a percentage of the rateable value of the assessed property) for carrying out essential repairs to privately owned old buildings which the owner has failed to

maintain properly, is a good example of a municipal body taking a hand in the maintenance of old buildings. However according to the provisions of the Act the salvage materials can be taken away by the agency carrying out the repair/maintenance work and according to the conservationists this has led to a lot of abuses and in some cases portions of old buildings have been deliberately dismantled and reconstructed mainly for the purpose of retrieving the valuable wooden beams and rafters and other salvage material. With suitable amendment the Act can be made into an effective tool for augmenting a Conservation Fund at the municipal level and suitable amendments can also be made to prevent any malpractice in the name of repair and maintenance.

7.5 **National Building Code.**—The NBC which lays down detailed specifications for all building construction activity and the materials to be used therein, will require to be suitably amended to incorporate the requirements of the restoration/renovation/repairs of historic monuments. This will facilitate necessary amendments in the municipal bye-laws also.

CHAPTER III

THE POSITION IN THE STATES AND AT THE CENTRE

1. After discussing the constitutional and legal position let us examine what is the perception of the Union Government, State Governments and the Union Territories of the task of urban conservation and how they are discharging the responsibilities cast on them under the law and the Constitution. It will also have to be seen what role the local bodies (i.e. the municipal organisations) have been playing and what has been the involvement of non-government organisations.

The States :

2.1 I shall first deal with the position in the States/Union Territories. Considering the vital role that the State Governments have to play in making programme of conservation successful not only in respect of the items which are their direct responsibility but also in extending co-operation to the Central Government to enable the latter to be effective on the ground. In order to gain first hand information I visited a few States in different regions and functioning under somewhat different circumstances. I visited Himachal Pradesh, Uttar Pradesh, Rajasthan, Karnataka, Maharashtra, Andhra Pradesh, Orissa, West Bengal and Goa. All the States with the exception of Gujarat, J & K, Madhya Pradesh, Tamil Nadu (a brief response came in November 1987), Haryana, Nagaland, Arunachal Pradesh and Mizoram, responded to a communication sent to them and furnished the required information either in course of my visit or through correspondence.

2.2 The following common features were noticed in conditions obtaining in the States :—

(a) Conservation of built heritage is still looked upon mainly as the work of protecting selected old monuments of historical and archaeological value. Under the Allocation of Business Rules of the State Governments the subject is the responsibility of the Department of Education or Culture and the State legislation under which the old monuments are protected is modelled on the Central Act of 1958 under which the ASI operates. In most States the age criterion adopted is 100 years.

(b) Funding for conservation whether in the Plan or in the non-Plan sector, is utterly inadequate.

(c) Barring one or two exceptions all the concerned departments suffer from organisational weakness and the field staff have very little training to discharge their responsibilities properly.

(d) It is only in the last 7 or 8 years that the town planners and architects and to a lesser extent the civil engineers, have become aware of the need for taking into account the requirements of conservation of built heritage in their professional work.

(e) A strong, well organised Development Authority with clearly defined responsibilities has generally been able to evolve development controls in support of urban conservation.

(f) With the exception of Bombay and partly Jaipur the municipal organisations in other urban areas have played very little active role in conservation work mainly due to the dismal financial condition of the municipal bodies in the country.

(g) There is an increasing number of encroachments and unauthorised constructions resulting in urban degradation and sometimes disfigurement of structures. More often than not the Development Authority or the municipal corporation is unable to take any effective action as the wrong doers have the protection or even active encouragement of local political bosses.

3. I now go on to give a brief account of the position in the States visited by me.

3.1 Himachal Pradesh

The work of conservation has so far been in charge of the Department of Language and Culture. The Himachal Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1976 and the Rules framed thereunder in 1985 are modelled on the Ancient Monuments and Archaeological Sites and Remains Act, 1958 (Central Act) and provide for the protection of monuments which are more than 100 years old. The major activity of the Department has been giving of grants for repair/restoration of temples which are more than 100 years old. The financial provision in the Seventh Plan for such restoration/repair work is Rs. 73 lakhs. To put the work on a systematic basis the Department has been carrying out, from 1985, a village to village survey with the assistance and guidance of the Archaeological

Survey of India (there is a Deputy Superintendent of Archaeology of ASI stationed at Simla). The survey is carried out by a Technical Assistant of the Department. He is assisted by the VLW/Patwari and the "key villages" are selected in consultation with the Deputy Commissioner. So far survey has been completed in 3 Tahsils, all in Sirmur District.

Of late the Town & Country Planning Organisation of the State Government, now about 5 years old, has been coming into prominence in the work of conservation. The INTACH appears to have played an active role in identifying important Heritage Zones in the State which is rich in temples and all that go with them. There are also some forts (Kangra) and mansions belonging to erstwhile Chiefs and Rulers which are of typical indigenous design and architecture. Because of historical reasons Shimla has a rich heritage of Indo-British colonial architecture. The Mall in Shimla with its slopes and gabled buildings had a character, though exotic, which was entirely its own. It has been spoiled to some extent by the unplanned construction of incongruous buildings and it is only now that the State Government has woken up to the need for having "conservation zones" the first of which will be The Mall. In my meeting with the State Government officers held in June 87 I was told that the Director Town & Country Planning Organisation had submitted detailed proposals for declaring an identified portion of The Mall as a Conservation-cum-Heritage Zone in which the architectural design, facade, colour schemes, display sign boards, repairs and restoration of existing buildings would be controlled under specific regulations. I was assured by the Director, T&CPO that the provisions of the existing law i.e. the State Town & Country Planning Act, were adequate for the formulation of such regulations. The project would be under the control of the State T&CPO. The Department of Urban Development would be the nodal agency for the conservation of built heritage. At present there is no architectural control on the design of the buildings nor is there any FAR restriction. The municipal bye-laws prescribed certain norms but did not go far enough. I was told by the State Government officers that the State Government were very much concerned about unplanned construction of buildings and had imposed a total ban on further construction of buildings in the Central Zone around the Jakoo Hill peak covering the entire Circular Road and exemptions could be granted only by the State Cabinet.

3.2 In their desire to restore The Mall to its pristine glory the State Government have taken up an ambitious project of reconstructing the Gaiety Theatre according to its old design but with provision of modern facilities at an estimated cost of Rs. 2 crores out of which only Rs. 10 lakhs are in sight so far. It is a matter of opinion whether such a costly venture should have been launched when it was really not a case of conserving an old building and when many other conservation projects in the State would soon be crying for funds (the total provision in the Seventh Five Year Plan for the Department of Language and Culture is Rs. 3 crores).

3.3 So far as the colonial buildings—residential or non-residential—are concerned they are all in use and are being maintained either by the Union or the State Government. I visited a number of them and found them in fairly good state of repair barring minor instances of the use of incongruous material for repairs (e.g. Gorton Castle). In the Old Viceregal Lodge (1888) certain mistakes committed earlier like the putting of varnish on the Burma teak panelling in the Banquet Hall had been rectified. The grey stones outside had shown signs of erosion at many places. According to experts this was due to bacterial action. On their advice a coating of silicon was applied with brush. This was expected to save the stones from further deterioration. Similarly for the preservation of the wood some chemicals were applied on the advice of experts. There was persistent leakage in the roof at a number of places. As Shalimar tarfelt was not proving adequate an epoxy resin coating was given at a total cost of Rs. 9.5 lakhs. I was informed that the Executive Engineer, CPWD had submitted proposals for installation of fire detection device (smoke sensitive). Considering that the panelling in the building, particularly in the Hall is of carved Burma teak and is practically irreplaceable it is essential that the proposal of the Executive Engineer is acted upon without delay.

3.4 While in Shimla I took the opportunity of calling on the Mayor of Shimla in his office on 10-6-87. Mr. Minhas Municipal Commissioner and Mr. Malhotra, Deputy Director LSG Department were also present. In response to my queries the following points emerged :—

(a) The abolition of octroi in which the Himachal Pradesh Government was one of the pioneers had hit the municipal finances badly. The State Government grant-in-aid in lieu of octroi adopted 1981 as the base year and allowed for 7 per cent annual increase. For 1987-88 the amount came to Rs. 47 lakhs against which the estimated realisation through octroi if it had continued was about Rs. 1 crore taking into account the increase in prices etc.

(b) 95% of the development work of the Municipal Corporation was dependent on grant-in-aid from the State Government. Most of the grant-in-aid came from non-Plan funds and there was an element of uncertainty due to a variety of factors and this made advance planning somewhat difficult.

(c) The position about recovery of taxes was not happy. The level of house tax was low and there was a lot of resistence to any upward revision of the tax. In 1986-87 the demand under house tax was Rs. 57 lakhs while recovery was Rs. 70 lakhs which included arrears. The actual expenditure was Rs. 320 lakhs out of which own funds was Rs. 204 lakhs and the rest was grant-in-aid.

(d) 60% of the total expenditure was on establishment.

(e) Mr. Minhas recognised that after the T&CPO notified the conservation zone in The Mall area certain consequential amendments would have to be made in the municipal bye-laws to ensure conformity with the regulations made in the T&CPO notifications.

(f) With reference to the repair/reconstruction of old buildings certain factors would have to be kept in mind, for example, some of the *Dhajjiwal* (mud) walls were being replaced by cement as insurance against fire hazard and also in view of the increasing cost of maintaining *Dhajjiwal* construction.

3.5 I also obtained from Shri R.C. Malhotra Deputy Director LSG Department a statement giving the actual income and the actual expenditure on establishment in different urban local bodies in the State in the last five years which will be found at Enclosure A. In the State there is a municipal corporation in 19 towns and Notified Area Committees in 28 towns. Information could be made available in respect of all municipalities and Notified Area Committees except 16. The statement makes interesting reading and shows that in most of the municipal committees/NACs, the expenditure on establishment constitutes a very high percentage of the revenue (excluding grant-in-aid). In some towns like Bilaspur the normal revenue in the last 3 years ranged between 2.9 lakhs in 1983-84 and Rs. 1.19 lakhs in 1985-86 while the establishment cost increased from Rs. 4.19 lakhs in 1984-85 to Rs. 4.93 lakhs in 1985-86. A similar picture is presented by Nurpur. The position in Nahan is much worse—in 1985-86 the total income was Rs. 3.73 lakhs against which the establishment bill was Rs. 13.29 lakhs. It is clear from the statement that a number of municipal committees are living from hand to mouth and are entirely dependent on doles from the State Government and most of the grant-in-aid is getting swallowed up by the huge establishment bill.

3.6 The Language and Culture Department have been sending their JEs and TAs to the Archaeological Survey of India for "on site" training. The staff of the LSG Department are not given any training in conservation at present but they are thinking of availing of the training courses run by the Archaeological Survey of India and NRLC, Lucknow. The local CPWD officers felt strongly that in-service training in conservation of buildings should be given to the CPWD staff and the courses may be designed by ASI in consultation with the CPWD.

4. Rajasthan

4.1 I visited Jaipur on the 15th and 16th of June 1987 and had detailed discussions with the concerned officers of the State Government at a meeting and also individually. I called on some knowledgeable non-officials like Mr. Mohan Mukherji former Chief Secretary, Rajasthan who is now heading a Committee on Municipal Finances set up by the State Government. I also visited some areas of Jaipur city which were of interest from the conservation point of view. The following points emerged as a result of the discussions and visits.

4.2 The State does not have a Town & Country Planning Act so far but a Bill modelled on the Central T&CP Act has been drafted and is expected to be placed before the State Legislature very soon. Most of the work is at present done under the Rajasthan Urban Improvement Trust Act, 1959. The State Government Town Planners were not very clear whether detailed zonal plans or action plans could be drawn up under the provisions of this Act. It is therefore very necessary that the State Town & Country Planning Act is put on the statute book as early as possible.

4.3 The State Government has taken up a project for the conservation study of Jaipur city on the lines of the Hyderabad project with Ford Foundation assistance. If the Hyderabad Report is any indication of the usefulness of the exercise, this is an excellent opportunity for all concerned organisations including the State Government to make their full contribution in ensuring that the Report becomes the basic document on which to base their conservation strategy with necessary phasing etc. Timely follow-up action is important and there must be the necessary political will to see it happen.

4.4 The State has a fairly active and vigorous Department of Archaeology but full understanding and co-ordination between the Departments of Archaeology and Town Planning is still to be evolved. The Jaipur Development Authority, particularly after the launching of the Ford Foundation Project is playing the major role in the conservation programme in the city with the Jaipur Municipal Council playing a supporting role through the implementation of certain specific provisions in the Jaipur Municipal bye-laws which lay down certain architectural norms and colour scheme (bye-law Nos 12, 16, 26 and 31 may be seen at Enclosure B). The Chief Town Planner of the State Government expressed the view that while the provisions of the

municipal bye-laws could take care of individual buildings the conservation of places or areas could be done effectively only through zonal plans and zonal regulations drawn up in the Master Plan.

4.5 There seemed to be a hiatus between the perception of the PWD and that of the Archaeology Department officers in the matter of conservation of old buildings. It was mentioned that the prescribed schedule of rates of the PWD was not suited to the requirements of conservation and work executed by the PWD in repairing the roof of Nath Mal ki Haveli in Jaisalmer had been found to be not upto the mark and therefore the work had to be entrusted to the ASI. The Chief Engineer PWD was of the view that the old buildings under the care of the PWD were being maintained without damaging their architectural integrity or character and the main problem was the ingress of water and to prevent this various steps required to be taken according to the seriousness of the problem. The architects and the officers of the State Archaeological Department thought that the approach of the PWD was over-simplified.

4.6 Secretary PWD made a very relevant point and that was that old craftsmen were disappearing and it was extremely difficult to get skilled artisans who could execute the work of repair/restoration satisfactorily. Particular reference was made to *Aaraish* work (lime and marble powder) which entailed the use of selected indigenous material to produce flooring and plastering of great beauty and required skilled handling by trained craftsmen. Considering the long time that is taken in preparing the material and the slow and painstaking nature of the process the output of an *Aaraish* mason could never be the same as the mason using cement and there is therefore very little demand for *Aaraish* work and the children of the old craftsmen have taken to other professions over the years. Undoubtedly some incentives would have to be offered to prevent the tribe of *Aaraish* workers from completely dying out. The rates of payment to such artisans would have to be made realistic and a roster of skilled *Aaraish* artisans could be maintained in the Public Works Department of the State Government to be drawn upon by the different Government or semi-Government agencies and payment made according to a schedule of rates which should provide for works of different complexities.

4.7 A refreshing example of help extended by a private charitable trust with the backing of a business house in conservation and restoration work is the project for the restoration of Govind Devji Temple covering an area of 53 acres on the outskirts of Jaipur in Amer foothills. The temple was in a state of neglect and was in ruins after the disappearance of the erstwhile ruling princes. The scheme of restoration was taken up as a result of an agreement between the Temple Trust and the Hindustan Charitable Trust and is to be completed in a period of two years at a cost of Rs. 60 lakhs. 35 to 40% of the work has already been completed. 98% of the work has been done with lime and *Aaraish* work has been done extensively. The person incharge of the project took me round different parts of the building where materials for *Aaraish* work were in different stages of preparation and I was left in no doubt about the genuineness of the work. The rates of payment made to *Aaraish* workers were higher than comparable wages paid to a mason using cement. A copy of the lease agreement executed between the Temple Trust (Lessor) and the Hindustan Charitable Trust (Lessee) is enclosed (Enclosure C). The project is a good example of the involvement of a private trust in conservation work though in this case it may have been motivated mainly by religious sentiments. It was interesting to note that though the temple complex was of Jaipur architectural style there were a few *Chhatris* which were of typical Bengali design. I was told that the Bengali priests who were employed by the then ruling Prince were responsible for this architectural variation.

4.8 A visit to Johri Bazar and Sireh Deorhi Bazar in the main city showed that there were quite a few violations of the municipal bye-laws with regard to architectural norms, placing of name boards etc. There are instances of reconstruction/new construction in violation of the Jaipur style of architecture. The matter was taken to the court by the offenders who took the plea that this particular style of architecture was no where properly defined. The municipal authorities are having discussions with the town planners and agreed norms are expected to be evolved and notified.

4.9 More disturbing are the large scale violations of the land use in Jaipur—more and more residential buildings are being used for commercial purposes as shops thereby fouling the environment of residential areas. Verandahs in front of the shops in the market which were constructed in Mirza Ismail's time according to a well laid out plan have been encroached upon on a large scale and are being misused. Projections are being made over the covered drains thus restricting the width of the *rasta*. I was told that pressure from local politicians made it difficult for the municipal functionaries to take any effective action against the wrong doers. There is also large scale construction of huts near the city wall without allowing the prescribed setbacks. Sometimes the huts are raised on the stone walls and the stones are pilfered and utilised for construction of such huts. The huts have come up in the *bazars* and also in the residential areas like Behrampur. This also had become a politically sensitive issue and the municipal authorities are content to remain as helpless spectators.

4.10 During a visit to Amer Palace I was told that the Notified Area Committee of Amer had planned to locate a housing colony on the periphery of the Palace grounds and were selling plots of land for the purpose of earning revenue for the NAC in spite of protests from the State Archaeology Department. There is no doubt that the beauty and the serenity of the environs of Amer Palace will be affected adversely if a bustling housing colony were to come up there and it could even affect the attraction of the place for tourists. The State Government would be well advised to prevail on the NAC to change its plans in this regard.

4.11 Under the Ford Foundation Project three experts—one on financial aspects (Shri Mohan Mukherjee, Retired Chief Secretary, Rajasthan), one on legislative matters (Shri R. M. Khinvasala, retired Law Secretary, Rajasthan) and the third on historical aspects (Dr. A. K. Das, Director City Palace Museum and Sawai Man Singh II Museum) have been engaged. This is a wise decision and will help in preparing the ground for taking proper follow-up action after the Project Report is ready. In my discussions with Mr. Khinvasara I gathered that some preliminary thinking had been done on the legal provisions to be made in the listing of monuments, listening to objections and appeals etc. but the exercise had been suspended in the expectation that the INTACH would get a comprehensive legislation—The National Heritage Bill—passed by the Central Government. However, at the working level among the Town Planners there is a strong feeling that a separate legislation on conservation with adequate teeth is necessary and the existing provisions of law under the Urban Improvement Trusts Act or the Jaipur Development Authority Act or the municipal bye-laws are not pointed enough to ensure effective and quick action. Representatives of the concerned department of the State Government were uniformly of the view that functionaries at different levels dealing with conservation must be given some orientation or in-service training and such courses could be designed and organised by the ASI and the State Government would meet the cost of the training for its own officers. They also agreed that the identification and listing of buildings and places would have to be done by trained people and it would facilitate work very much if a list of qualified architects/engineers including retired hands available in different parts of the State could be drawn up after proper scrutiny. The individuals could also be invited to give their willingness and register themselves on the same lines as approved valuers. Their services could be availed of on payment of prescribed fees for different types of work.

4.12 At the State level meeting senior representatives of the Department of Archaeology also made a plea for the creation of a small but specialised works cell in the Department consisting of a few hand-picked engineers and architects to function on the same lines as the Engineering Organisation of the ASI.

5. **Uttar Pradesh**

5.1 Uttar Pradesh has no Town & Country Planning Act and Master Plans have been prepared under U.P. Urban Planning and Development Act, 1973. There are 20 Development Authorities in different cities/towns of the State. There are also regulated areas under the U.P. Regulation of Building Operations Act. Though the State Government Officers felt that the emphasis should really be on implementation rather than new laws they also recognised that in the absence of a Town & Country Planning Act covering the whole State integrated planning on a regional basis was not easy as each Development Authority functioned within its own limits. A strong plea was made for having a manual on conservation work to be prepared more or less on the same lines as the ASI Manual. This would be a useful hand-book for all functionaries for day-to-day reference.

5.2 In the last 3-4 years the State Town & Country Planning Department and some of the Development Authorities have come to recognise the need for including conservation in the urban planning exercise. For example, in the process of the revision of the Master Plan for Lucknow the studies included a physical survey by the ASI and in the detailed zonal plans for the 18 zones in the city all historical buildings/heritage zones will be covered and there will be special zonal regulations for the conservation areas. Whatever may be the plans on paper encroachment is quite rampant in Lucknow and the State Government officers were frank enough to admit that 10 to 15 per cent of the entire nazul land in Lucknow is under encroachment. During my visits to some of the old buildings including the environs of CHHOTI IMAMBARA and of the JAMA MASJID (behind Chhoti Imambara) I could see jhuggis, unauthorised shops and other incongruous buildings which had spoiled the environment and disfigured the setting of the majestic Jama Masjid. The Superintending Archaeologist ASI at Lucknow (Mr. Nigam) whom I met in course of my visit to the Old Residency building also complained bitterly about the encroachments and the inability of the local authorities to deal with the menace firmly. Accordingly to him unauthorised construction which affected the environs of the monuments was the biggest problem of Lucknow Circle.

5.3 In Varanasi, thanks to the Central Ganga Authority project for the Improvement of the Ghats and the encouragement given by the INTACH in various ways including renovation of some buildings in Manikarnika Ghat with private assistance and the organisation of a

Seminar on Conservation in May 1987, there is an awareness about the need for taking positive and urgent steps to preserve the cultural heritage in the famed city. Varanasi Development Authority is playing a major role in this. The Master Plan of the City drawn up in 1974 is under revision. The VDA has already decided through a Resolution that the river front profile will be maintained and no new construction will be permitted without due scrutiny. However, declaration of the Ghat area as a Heritage Zone is still to be made. I was told by the Vice Chairman VDA that zonal plans for certain zones like Chitupur-Shivpurwa zone and zoning bye-laws have been drawn up and sent to the State Government for approval. He also informed me that it was being examined with the assistance of experts of Architecture and Arts Departments of the Benaras Hindu University as to what kind of architectural controls and height restrictions would be desirable for an aesthetic skyline of the Ghat area.

5.4 Considering that the Central Ganga Authority Project Phase I for Varanasi is to be completed by the end of the Seventh Plan at an estimated cost of Rs. 250 crores the agencies executing the work including the State Irrigation Department, the Municipal Corporation and the Varanasi Development Authority will not be short of financial resources.

5.5 In course of my tour of the 7 km. stretch of the Ghats I could see the work in progress at several places for the repair/reconstruction or beautification of different Ghats but within the city the success of any conservation programe would depend largely on the ability of the authorities to remove the very large number of encroachments. I was told by the Vice Chairman VDA who is also the Commissioner of the Municipal Corporation that there were no less than 11,000 cases of unauthorised constructions in which demolition orders had been passed and even appeals had been rejected but the demolitions have still to be carried out. This was mainly due to the interference of the local influential non-official "bosses" and partly due to insufficient number of demolition squads. Vice Chairman VDA felt strongly that the Municipal Corporation should be provided with stronger demolition units with adequate number of vehicles and staff. He also advocated an amendment in the law authorising summary removal of unauthorised construction on public land and also make the offence a cognizable one. I was told that another factor which was contributing to the degradation of Varanasi was the increasing conversion of residential houses to *katras* in violation of the prescribed land use. Under certain instructions of the State Government the offence is to be treated as compoundable but the instructions themselves were not very clear. If violation of land use is going to be treated so lightly particularly in an overcongested city like Varanasi any exercise at urban planning or even urban management will be a mockery.

5.6 The local Registration Officer of the State Department of Culture has identified 43 old monuments/buildings for conservation in Varanasi. The work is done in close collaboration with the revenue staff of the Collectorate under the direction of the Collector. A vast number of temples/mosques etc. still remain to be surveyed and evaluated for listing. It appeared to me that there was scope for closer coordination in this effort between the Collectorate and the VDA and the Municipal Corporation.

5.7 In the River Front Improvement Project the position regarding ownership of land was sometimes not very clear and response was lacking from the owners of the buildings on the Ghats. From my discussion with the local revenue staff and some non-officials I learnt that the position was roughly as follows :—

1. LAND		OWNERS
(a)	River bed and sandy portion of the river bank.	State Government.
(b)	Actual Ghat area i.e. Ghat steps and platforms.	Municipal Corporation.
(c)	Lands providing approach to the buildings.	Municipal Corporation.
2. BUILDINGS		
(a)	Commercial	A few shops and hotels owned privately.
(b)	Subha Shouchalaya units, sewage pumping stations and a few other buildings are Government owned. All other buildings including residential houses, *maths*, *Dharmashalas* are all privately owned by ex-rulers, zamindars and *babus* most of whom are absentee owners.	

5.8 An interesting fact mentioned to me by a local shop keeper was that more than 50% of the privately owned buildings including property owned by a large number of non-resident Bengalis have been virtually captured by *Yadavas* ostesibly occupying the houses as employees of the owners but in fact having full control over the building. In practically all such cases no mutation has been done and therefore if any restrictions are imposed or any norms are prescribed regarding the standard of maintenance of these buildings as a part of the conservation effort, these *de facto* landlords would easily evade responsibility and very few of them would be interested in observing the prescribed norms in the conservation zone. The only remedy would be to undertake a house-to-house survey immediately to find out the *de facto* position of occupancy and update the municipal records. The zonal regulations for the conservation area in Varanasi should take into account certain characteristic features of this all important pilgrimage city and make necessary provisions for their preservation.

5.9 In U.P. the State Archaeology Department looks after the conservation of old monuments and buildings. Besides its Headquarters at Lucknow it has two regional units one at Almora in the Kumaon Hills and the other at Pouri Garhwal Hills. The Organisation looks after the conservation of such old monuments of historical, archaelogical or artistic interest as have been declared as "protected" under the U.P. Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1956 (U.P. Act No. VII of 1957). 55 monuments have so far been declared as "protected" and 20 more are proposed to be so declared. The Organisation is under the control of the Department of Cultural Affairs. It would appear that the U.P. Act was passed even before the corresponding Central Act and considering the size and importance of a State like U.P. one would have expected the organisation to have grown considerably in strength and activities. Unfortunately, the picture is one of stagnation and even in terms of budgetary provision the financial outlay is woefully inadequate as would be clear from the following table.

	1985-86		1986-87	
	Non-Plan	Plan	Non-Plan	Plan
	(Rupees in Lakhs)			
Total budget	9·55	Nil	11·11	Nil
Provision for conservation	0·95	Nil	1·90	Nil

The strength of personnel is also very inadequate as would appear from the following list.

	Head quarters	Hills Units
i. Archaelogical Engineer (Rs. 850—1720)	1	..
ii. Conservation Asstts. (Rs. 550—940)	4	2
iii. Junior Engineer (Rs. 515—860)	1	..
iv. Draughtsman (Rs. 515—680)	1	..
v. Works Foreman (Rs. 315—440)	1	..
TOTAL	8 +	2 = 10

It is clear that a fairly massive effort would have to be made in terms of organisational effort and financial outlay for carrying out the barest minimum programme which the most populous State of the country with vast cultural heritage deserves.

5.10 The staff of the concerned Departments including Archaelogy, Town Planning and Urban Development would have to be put through in-service courses of training in conservation of appropriate duration in a systematic manner. The courses would have to be designed and organised by the ASI at suitable locations in different regions of the country with the States sharing the cost of training according to an agreed formula. One such regional centre could certainly be set up by expanding the existing facilities at NRLC Lucknow.

6. Karnataka

6.1 In Karnataka, which has a very rich heritage of built environment, the work of conservation is looked after by the Department of Archaelogy but the Karnataka Town & Country Planning Act, 1961, the Karnataka Municipalities Act, 1964 and the Karnataka Village Panchayats and Local Boards Act, 1959, have certain regulatory provisions which have been brought into use in support of the conservation effort both in Bangalore and in a few other towns like Bijapur and Badami and also villages like Aihole (see copies of the notifications enclosed at Enclosure D).

6.2 In Bangalore a Development Authority was set up under the provisions of the Bangalore Development Authority Act, 1976, and the high level advisory body called the Bangalore Urban Art Commission was constituted according to the provisions of Section 51 of the same Act.

6.3 Bangalore has a comprehensive development plan with prescribed zoning of land use and regulations to provide for controlled development of the Area of Special Control in respect of :—

— style of architecture

— colour of building and

— elevation of the building.

Such Area of Special Control is to be found within 50 metres of certain identified monuments/buildings in the State. The Building Bye-laws of the Bangalore City Corporation lay down that the licencing of buildings in certain public places and roads shall be as per the guidelines of the Bangalore Urban Art Commission. For more than a decade the growth of Bangalore has been phenomenal (it was the highest among the metropolitan cities in the last census) and since much of the growth was not on the desired lines the town planners and city fathers thought of special measures to ensure orderly growth in keeping with the interests of conservation. There is greater consciousness about the need for conservation and the famous 18-Kutcherry case in which the public took their protest upto the Supreme Court and gained partial success, has put Bangalore squarely in

the map of the conservation movement. The local INTACH Chapter is also quite active and listing of historic buildings has been taken up in a number of towns including Mysore, Raichur, Gulbarga and Bijapur. The Bangalore Urban Art Commission has so far identified 140 historic buildings out of which 55 had been listed as important. However much would depend on the political will to effectively enforce the restrictions provided under the law. In my meeting with the State level officers I gathered that large scale conversion of residential buildings into shops were still going on in certain areas like Avenue Road, Chickpet, Balepet, Cottonpet etc. According to a Press Report the State Government had decided to regularise no less than 1—½ lakh cases of unauthorised constructions in Bangalore alone.

6.4 The State Department of Archaelogy has a grant of Rs. 5 lakhs only for the year as against a minimum requirement of Rs. 20 lakhs. A serious lacuna in the State legislation is that there is no way to prevent demolition of an existing historic building by its owner if he choses to do so.

6.5 The State Government officers both of the Department of Archaelogy and the PWD were very keen that in-service training in conservatioin to be arranged for all the staff concerned with the maintenance of old buildings. Such training may be designed and organised by the ASI at suitable centres in the country.

6.6 Officers of the Archaelogy Department made a plea that an area of 100 metres around protected monument should be included in the notification under the Act.

7. Goa

7.1 Goa has a position of unique importance in the conservation programme of the country irrespective of its small size. This is partly because of the significant linkage of conservation with tourism and partly because of the genuine interest of Goans in their heritage. In the State the Department of Archives is incharge of the protection of old monuments while the work of conservation through development controls is looked after by three Planning and Development Authorities, namely, Planning & Development Authority, Panjim, Southern Planning & Development Authority (HQ Margao) and Marmugoa Planning & Development Authority (HQ Vasco), all constituted under the Town & Country Planning Act under the administrative control of a fairly strong Town & Country Planning Organisation. The Secretaries of all the three Development Authorities are Town Planners who are deputed by the Town Planning Department of the State Government.

7.2 An interesting feature is that building bye-laws and zoning regulations apply to certain rural areas in the same manner as urban areas in Goa and this has made it easier for such regulations to be enforced as people are receptive to the idea. Before Liberation the Municipal Councils in Goa had jurisdiction over all the villages in the Taluka and were able to control/regulate the construction of new buildings in rural areas also. After Liberation suitable provisions were made in the Goa Panchayat Regulations Act, 1962. Goa has about 400 villages constituting 200 Panchayats. A total of about 50 villages come under the three Planning and Development Authorities in the State. Under the Southern Planning and Development Authority there are about 18 villages besides Margao and Ponda. An engineer of the level of Assistant Engineer assists the Panchayat authorities in the technical scrutiny of the building applications filed in the Taluka. In the village which come under the PDAs such scrutiny of applications and their clearance is the responsibility of the PDA. About 35 villages in the State located in the coastal areas qualify for special treatment on the strength of their population and importance from the tourism point of view. In these villages clearance of building applications is given by CTP. According to 1981 census out of 15 towns in 11 Talukas 9 have Municipal Councils categorised as A, B & C. Five major towns and a total of 25 villages are covered by the three Planning & Development Authorities. The Village Panchayat Regulation of Building Rules (1971) flowing from the 1961 Act provide for the control of buildings in Panchayat areas.

7.3 In the State 25 monuments including old churches, temples, etc. are under the protection of the ASI and another 44 under the State Archives Department. There is a keen desire to conserve in an appropriate manner the characteristic colonial built heritage of Goa and dovetail it with the other development projects like the Master Plan for Tourism which contemplates the setting up of 20 star-hotels all along the beaches. A State level Committee of Experts have recently completed a survey of old buildings, wells, natural springs etc. which should be brought under the conservation programme. The three Planning-cum-Development Authorities have also identified conservation areas and have imposed various development controls which are being implemented. Goa has therefore reached the take-off stage and is now facing some of the inevitable criticism from the affected residents who feel that they are unable to get the maximum economic advantage out of their property by the various restrictions imposed under the conservation programme. They are therefore demanding compensation or incentives and also for grants for the maintenance of the property according to the prescribed norms. Recognising that it will not be a feasible proposition for either the State Government or the Development Authorities to provide for financial assistance from budgetary sources on any significant scale the State level

committee has made some interesting recommendations for re-use of such property and offer incentives in the shape of certain tax exemptions. The committee has also made a distinction between protection area and conservation area, the former being applicable to a very few buildings and the latter would permit "internal" changes and restrict application of the control to exterior appearance (facade) and height restriction only.

7.4 The State town planners who are principally in charge of the conservation programme are also worried about the absence of an agreed approach to the tackling of the problem of implemnting the conservation policy on the ground. For ensuring that all the concerned officers face the problem with courage and confidence it is important that a policy resolution is adopted at the Cabinet level by Government to reflect the political will of the Government to put through the programme.

8. **Orissa**

8.1 In Orissa there are two Development Authorities for Bhubaneswar and Cuttack under the Orissa Development Authorities Act, 1983 and 5 Improvement Trusts under the Orissa Town Planning and Improvement Trusts Act, 1956 for Puri, Konarak, Talcher and Angul, Sambalpur, Berhampore and Rourkela. There is no Town & Country Planning Act in Orissa though the Town Planners have been trying to get such a legislation passed. The State Town Planner agreed that under the ODA Act and TP & IT Act zoning regulations could be drawn up incorporating development controls to meet the requirement of conservation but the TP & IT Act does not have any penal provisions and unauthorised constructions cannot be pulled down under the existing provision of this Act. Such demolition can be done under the ODA Act but operationally demolitions are best carried out by the municipality. The State Town Planning officers frankly admitted that so far conservation as in item under town planning had not engaged the attention of the town planners in the State in their town planning exercise but the process had begun seriously now. They were keen to participate in in-service training programme in conservation that may be organised by the ASI.

8.2 Puri, the seat of Lord Jagannath is a great place of pilgrimage and a very well known sea side health resort and has its own problems of environmental degradation. Lord Jagannath's temple is in a congested area with shops and other incongruous buildings abutting the temple walls and with open drain fouling the atmosphere. The beautiful sea beach is also getting crowded with increasing population and in spite of the decision of the Central Government that no new construction be allowed within 250 metres of the high tide line exceptions have been made mainly in favour of public sector hotels and other government buildings. The main sewage outfall into the sea is near the prestigious 'BNR Hotel" and there is a large growing fishermens' slum with a population of about 25,000 situated on the beach within 5 km. of the central beach area. In my discussion with Director General Tourism Government of India I was given to understand that the earlier norm of keeping a construction-free zone of 500 metres from the high tide line had now been reduced to 200 metres and an inter-Ministerial Committee decided on merits any exemption on special grounds. I think it is important that the inter-Ministerial Committee consider how the problem of fishermens' slum in Puri which is undoubtedly a very serious source of pollution should be tackled. Considering the importance of the pilgrim city-cum-health resort, it deserves to have a comprehensive development plan which should cover all the aspects of the development of the town.

9. **Andhra Pradesh**

9.1 More than any other project in the country the study on Conservation of Historical Buildings and Areas in Hyderabad City sponsored by the Ford Foundation and completed in the beginning of 1985 can be taken to be the path finder for such work in the country. The Ford Foundation considered the study as a pilot project for South West Asia and while the grant (US $ 35,000) was modest the study has had a very high catalytic effect. Jaipur has mounted a similar study and in course of my visits to some other States I could see a very keen interest among the concerned officers in getting a similar study sanctioned for the largest cities (e.g. Calcutta).

9.2 The Hyderabad Urban Development Authority constituted under the Andhra Pradesh Urban Areas (Development) Act, 1975, as the planning, development control and co-ordinating agency for the metropolitan area of Hyderabad felt that a comprehensive study should be done to identify areas and buildings of historical and architectural interests and to work out administrative, legal and financial strategies for their conservation. Accordingly, a study was commissioned with Ford Foundation Assistance. A small Cell was created in the HUDA to do the work. It was headed by an Architect-Town Planner specialised in urban conservation assisted by two graduate architects, two surveyors with background of civil engineering. A Technical Advisory Committee with architects, historians, archaelogists, administrators and town planners of eminence both from Hyderabad and outside was constituted by HUDA for providing guidance to the Cell from time to time. In addition, the advice of some experts in town planning and urban conservation as consultants was also made available. The

different aspects of urban conservation covered by the Final Report were as follows :—

1. Identification of buildings and areas and documentation—criteria and methodology.
2. Architectural styles of the city—basic research on one of the criteria.
3. History of the city's urban growth—chrolonogy was compiled besides collecting period maps.
4. Legislation for conservation. After a long discussion of the existing legal provisions in India and conservation legislation in developed countries a draft was recommended for Andhra Pradesh.
5. Financial inducements to owners—tax concessions and other incentives.
6. Cost benefit analysis of conservation—re-cycling through actual case-studies.
7. Planning policy and conservation—land use and other controls.
8. Conservation and environment—traffic and aesthetic control.
9. Public participation—people involvement.

9.3 The study team went into the history of the city's growth and development and traced the origin and importance of different areas. The old areas and the historical buildings in particular were visited by the team for a preliminary survey after which the following general buidelines were adopted for the selection of buildings for detailed study.

(a) Age of the building (*even 50-year old buildings were included*);

(b) Archaelogical excellence or style of any particular period;

(c) Relevance to the social and economic history of the city;

(d) Association with well-known persons or events;

(e) Its value as a part of a group of buildings; and

(f) Its re-use potential and suitability to conservation through re-cycling.

9.4 For the first time a detailed study was carried out to trace the architectural styles of Hyderabad city and 10 distinguishable architectural styles could be identified during the survey. The Quli Qutab Shahi style represented by the Charminar, the great mosques and the royal tombs is one of the provincial Indo-Islamic styles.

The study identified 165 buildings (consisting of 174 structures) in the first instance representing all styles and periods. Some buildings selected for detailed study were structurally surveyed to determine the general nature and extent of repairs required and cost estimates were prepared. For these buildings alternative re-use analysis was carried out to provide a basis for pilot projects to be undertaken in future. An attempt was made to compare the financial viability of refurnishment of old buildings as against demolition and redevelopment. In most cases it was found through rough estimates that conservation and re-use of old buildings in the context of Hyderabad required less initial capital and produced better returns compared to the redevelopment. However it was also found that the conservation schemes would need to be supported by a sympathetic urban policy in which the land use plan and the distribution of floor area ratio (FAR) favoured re-cycling rather than re-building in the case of listed buildings.

9.5 Another importance point is the typological classification of buildings. In the case of Hyderabad the following typologies were found to be present among the listed buildings :—

(a) Religious (mosques, temples, churches and tombs etc.);

(b) Monumental structures (gateways, towers etc.);

(c) Palaces and complexes;

(d) Buildings with internal courtyard (Devidis and Havelis);

(e) Pavilions (in gardens);

(f) Small buildings in a row (road side groups); and

(g) Individual buildings (relatively small buildings, detached structures).

Typological analysis is essential for the purpose of recommending adaptive re-use of buildings. For example, palace complexes having large rooms and corridors can be best used as public buildings such as hospitals, colleges, hotels, law courts, libraries etc. Buildings with internal courtyards must be put to such use that the open courtyards are effectively used as places of gathering and public activity like dance schools, museums, venues for exhibition etc. Small buildings in a row are useful as residences. Besides individual buildings special areas were identified in three categories, namely :—

— conservation areas (immediate surroundings of protected monuments and important listed buildings);

— design zones (newer areas requiring design control over new buildings); and

— neighbourhood improvement areas (area requiring specific improvement of buildings, structures, streets, facades and basic urban services).

Conventional "conservation area" as understood in European countries was not found applicable in Hyderabad conditions as there was hardly any area left in the old city which could be identified as an ensemble or a street or quarter of coherent architectural quality. New developments have ruthlessly disrupted the visual continuity and architectural integrity of the traditional neighbourhoods.

9.6 As regards the incentives to private owners certain interesting conclusions have emerged in course of the study. It is recognised that it will not be practicable to acquire and protect all the privately owned listed buildings not only because of constraint on financial resources but also because this may not be the best solution. In most cases the best strategy would be to encourage the owners themselves to conserve and re-use their buildings. The study revealed that more tax incentives would not make much difference in individual attitudes of propensity to preserve the listed properties with the low incidence of taxes and with the decreasing value of the listed properties. An imaginative grants or loans scheme may get certain private individuals, religious public and government institutions interested in preserving the buildings. It has also been suggested that the urban development authority should provide professional and constructional services in such cases. In the case of private owners exemption from property tax may not be an attractive proposition. The study has suggested that exemption from income tax, gift tax and wealth tax may yield better results. In the case of listed properties the State Government may also exempt the Transfer Fee. It has also been suggested that the listed buildings and areas in the historic centre may be notified as Free Trade Zones by extending total or partial exemption from sales tax and entertainment tax. A Revolving Fund both at the Central and State Government levels for receipt of donations for urban conservation may also be created.

9.7 As regards legal measures the conclusion reached through the study is that while the thrust should be on promotional and positive measures like creating public awareness and providing certain incentives the task of urban conservation in a rapidly developing city must be simultaneously accompanied by restrictive legal provisions and such law must be part and parcel of urban administration and enforced by the civic bodies of authority who control land use and the intensity of development. The present urban development law in the State i.e. Andhra Pradesh Urban Areas (Development) Act 1975 would require to be strengthened with provisions to declare "listed buildings" and "conservation areas" and making it compulsory for the owners of such buildings to take permission before demolition, addition or alteration. A draft law has been formulated so as to fit into other Central and State laws on land acquisition, property and town planning. The law will empower the urban development authority to relax land use regulations when there is a need to allow a more remunerative use of a listed building for re-cycling. The law will enable undertaking conservation and rehabilitation projects by utilising housing development funds such as HUDCO loans. Considering the importance of the item it will be appropriate to indicate the salient features of the draft Bill as recommended by the study. They will be found at Enclosure E.

9.8. In my discussion with the Vice Chairman, HUDA I learnt that the draft legislation has been submitted to the State Government by the HUDA as a part of the follow-up action of the Study Report but the decision of the State Government was still awaited. Needless to say the matter needs to be expedited in the interest of the early implementation of the Conservation Project.

9.9 I learnt from Vice Chairman, HUDA that though effective follow-up action on the Ford Foundation Project Report was taking time, the Quli Qutub Shah Development Authority set up in 1981 as a registered society with the Chief Minister as the Chairman of the General Council and the concerned Minister as the Chairman of the Board had prepared a plan for the development of Charminar Area in 1986-87 more or less accepting the recommendations of the FF Report (Char Minar is also protected by the ASI). The QQSDA is heavily supported by the State Government and in fact the implementation of the Resolutions passed by the QQSDA is taken to be the responsibility of the HUDA to the extent that the Engineering Wing of the QQSDA needs such support from the HUDA. The annual budget of the society is of the order of Rs. 4.5 crores (1987) practically all of which comes from the State Government grant-in-aid. In 1986 the budget was Rs. 7 crores and between 1981 and 1986 a total amount of Rs. 15 crores has been given by the State Government as grant to the society. The programme for development of the Char Minar Area which is the core area of the old city of Hyderabad consists of improving the road and the traffic system; acquiring of land where necessary; improving educational and health facilities and also improving the environmental conditions by improving drainage, water supply; developing open spaces and play grounds etc. The estimated cost is Rs. 30.34 crores and the work is expected to be done by the concerned Departments of Government, the State Electricity Board, the Municipal Corporation, the HUDA and by QQSDA itself. The other conservation projects either sanctioned or completed by the QQSDA are :—

(a) Development of the Qutub Shahi Tomb area (an area of 93 acres to be developed at an estimated cost of Rs. 1.1 crore).

(b) Malwala Palace.

(c) Mahboob Mansion.

(d) Paigah Tombs.

(e) Aasman Garh Palace.

9.10 As a spin-off of the FF Project Report the Andhra Pradesh Tourist Development Corporation have taken up the Golkonda Fort (ASI protected) and the Qutub Shahi Tomb (protected by State Archaelogical Department) for installation of Light and Sound programme facilities.

9.11 At the State level meeting with the officers of the State Government, the local representative of the INTACH and others the following points came up in course of discussions :

— The current socio-economic forces were destroying the discipline and the character of the city and also disturbing its social fabric. In the development of new areas the urban design was not very satisfactory.

— In the old city the typical lanes have not been maintained properly and some of the old buildings have disappeared. The old architecture of Hyderabad is of a mixed design and has to be properly appreciated.

— With the explosion of population controlled development is becoming very difficult. There should be a wider concept of conservation and in fact one could think of a conservation programme of water supply, telephones, etc. In other words, efficient management of urban affairs has to be ensured.

— The attitude of the authorities has not been very consistent in space planning in the city.

— The working conditions of the Hyderabad Urban Art Commission were not suitable as a result of which *the Art Commission has become defunct.*

— Banjara Hills which was essentially a residential area is being converted to commercial use particularly hotels, truck base etc. with inevitable environmental degradation.

— There must be an Art Commission *with adequate powers to enforce their decisions.*

— Western countries are very conscious about conservation and in the UK in practically every town urban conservation is being attended to. We in India should have thought of urban conservation much earlier.

— Let us try to find effective means of preserving whatever is left of our heritage and do whatever is possible quickly under the existing provisions of law.

— Even within Golkonda Fort unauthorised constructions are coming up. There is vandalism in Golkonda Fort and the chowkidars cannot control everything. There is great need for educating the people.

— In Golkonda Fort Basia and another colony had come up in 1984. The State Government was moved but nothing happened. In 1985 a writ petition was filed against the two colonies and the court gave a stay order but the encroachers are getting water supply and electricity—How ?

— In 1986 INTACH offered to publish the FF Study Report but nothing has been heard from the State Government.

— The heritage of the city was being destroyed. There should be a high level body including representatives of local bodies and others which should decide whether any listed item of Built Heritage should be allowed to be demolished/destroyed.

— Unauthorised construction has been going on in the Golkonda Fort with the connivance of the municipal staff and even Municipal Councillors. The land use around Golkonda Fort has been changed in response to Smt. Pupul Jayakar's letter to the State Government and the observations made by the other visitors from Delhi about the degradation of the environs of the Fort. Even the moat portion of the Fort has been squatted upon and the State Government revenue employees are giving *Pattas* Most of the Government land (marked as 'green' area around the Fort) has been encroached upon.

10. **Maharashtra**

10.1 **Aurangabad .**—I visited Aurangabad in Marathawada on 17-6-87. Apart from having discussions with the local officers of the State Government I visited some important monuments accompanied by the local Superintending Archaeologist of the ASI. The important monuments/buildings visited were :

(i) Ellora caves;

(ii) Daulatabad Fort and

(iii) Bibi-ka-Makbara which is also known as the Taj of the Deccan.

Some significant facts were given by the local officers who also made useful suggestions.

10.2 The visit to Ellora, Daulatabad Fort and the Bibi-ka-Makbara was quite rewarding and

I could see the odds against which the local officers of the ASI had to contend in discharging their duty. The general points made were :—

(a) Many of the protected monuments were seriously threatened by encroachment. As a preventive measure the protected monuments/areas should be fenced either by a pucca wall or at least by barbed wire fencing. Priority should be given to places where encroachment is imminent. A case was cited where structures had started coming up in the prohibited area of a monument and among the interested people was the son of a Minister and therefore appeals made to the local officers by the officers of the ASI for intervention were in vain as the local officers were afraid to take action. The officers of the ASI then discreetly took the matter to the Press and when it was flashed in the papers the local authorities had no option but to take action.

(b) On the point of co-ordination between the officers of the State Government and the ASI of the State level I learnt that the recent circular of the ASI directing the local Superintending Archaeologist to take initiative to organise co-ordination meetings at the State level with the State Education and Culture Secretary as Chairman and the State Director of Tourism and Director of Archaeology as members, had been acted upon and the meeting had provided a right forum for bringing up important issues.

(c) The Town & Country Planning Department, the Development Authority (if any) and the municipal authorities should invariably consult the local officers of the ASI whenever the protection of any building or monument is taken up for consideration. This is a good suggestion.

(d) There should be a well-planned effort to get school children interested in archaeology from a very young age (say IV standard). This can be done by making the subject compulsory from the primary level upto the tenth standard. Archaeology can be included as a part of History which is already a compulsory subject. Stories associating kings and queens with the monuments, palaces and buildings should be written in an attractive manner for children. The book should be in the local language and there should be one chapter which will give a list of the monuments of national importance with broad details under each item.

(e) Bibi-ka-Makbara in Aurangabad is a mausoleum constructed in 1660 by Azam Shah the fourth son of Aurangzeb in honour of his mother Dil Ras Banu Begum. It is known as the Taj of the Deccan and is said to be a copy of the Taj in many respects but the use of marble is much less and there are no semi-precious stones. Instead of marble cladding on the outside the building has lime plastering konwn in Marathawada as *SANDLA* work similar to *AARAISH* work in Rajasthan. All around Bibi-ka-Makbara about 6 acres of land had been declared as prohibited or restricted area. The ingredients of *Sandla* work are : lime soaked in water for 7 days; *surkhi* (ground bricks); fine sand, jute strands (small pieces); *gond* (glue); *guggal:* jagvery; linseed and ripe *Bail* fruit pulp (without seeds) soaked in water. The materials are used for preparing the base. The solid hard items are ground and screened and thereafter made into a paste for preparing the base. For the fine layer of plastering done on top the materials used are : lime, mica powder, *urad dal batasha* (made from sugar cane) and *sanjera* powder ground (stone). It is becoming increasingly difficult to obtain services of skilled masons/artisans who can do *Sandla* work satisfactorily and also make designs on the plaster. I saw some of the designs made on the plaster of the wall of Bibi-ka-Makbara. They were beautiful. The raised designs looked like carving and only a very skilled artisan could have executed it. I was told that even today the wages paid to a skilled mason trained in *Sandla* work are not appreciably more than the wages paid to an ordinary mason and therefore *skilled Sandla* masons were becoming scarce.

10.3 At the meeting of the local State level officials held in Aurangabad Circuit House the following important points were made :—

(i) 160 out of 200 identified monuments in the State are being protected under the Maharashtra Ancient Monuments and Archaeological Sites and Remains Act, 1960 (*Age limit of buildings* 50 *years*). Out of 160, 30 are in Aurangabad and of these 30, 12 are *sarais* and 2 are old palaces. Ajanta *sarai* is about 500 years old.

(ii) It has been proposed that Khurlatabad hill station (near Ellora) to be notified as a conservation area under the Development Plan.

(iii) A Committee under the Chairmanship of the District Collector with the Town Planner, Archaeologist, a representative of the Municipal Committee and others as members should handle development proposals in conservation areas. Certain norms have also been suggested for this.

(iv) There should be an under-graduate course in town planning to build up a cadre of Chief Officers in municipal administration. At present in Marathawada there are 50 Municipal Councils and 1 Corporation. In 5 Class A Municipal Councils the Town Planners are on deputation at the level of class II gazetted officer. They are working as Chief officers in Class A Municipal Councils. The Chief Officers of the remaining 45 Municipal Councils are non-technical people and are generally taken from the Revenue Department of the State Government who do not have full understanding about the development planning of towns. Therefore an under-graduate course in town planning for Chief Officers in the lower grade municipalities will be useful.

(v) The Municipal Corporation of Aurangabad has been under supersession since 1982.

(vi) According to 1981 census the population of the town was 2.3 lakhs. Today it is around 4.5 lakhs. Roughly 50% of the new constuction in Aurangabad is *unauthorised.* Cases have been instituted for violation of the development control norms mainly regarding and use. There is tremendous pressure on land and industrial units attract people from rural areas. The common method of encroachment/unauthorised construction is *to put up a khokha* with the blessings of *the local dada* (mostly a political heavy weight). In many cases the local politician or a *goonda* acts as the middle man in the illegal construction project. Court cases take a long time. In one case the court ordered that the offending party should demolish unauthorised structure themselves and till such time they did so they would have to pay Rs. 25/- per day. The party has been paying the amount for the last 6 months but has not pulled down the structure. This shows that the amount is too small and is not a deterrent considering the commercial gain that the party is getting from the unauthorised construction. The police also do not respond promptly on the plea of other commitments.

10.4 The facts given about encroachments and other unauthorised construction are indeed very damaging to the manner in which the local bodies are functioning. One would have expected that under conditions of supersession the officers would have acted more independently and fearlessly but in actual practice it is not so and it probably reflects an all pervasive state of demoralisation which has made it difficult to stem the rot.

11.1 **Bombay.**—On 2-7-87 I visited a number of selected buildings and monuments in Bombay and also attended a State level meeting at which well-known non-officials interested in conservation, the Convenor of the Bombay Chapter of INTACH and the concerned senior officers of the State Government were present.

Among the metropolitan and other large cities in the country Bombay is the only city in which the Municipal Corporation plays the leading role not only in the enforcement of the municipal laws but also the development controls in town planning. This has been made possible largely because of the administrative strength and financial viability of the Corporation. In the island city the Bombay Metropolitan Regional Development Authority (BMRDA) has important functions as a Development Authority but in the enforcement of the development control regulations it can only claim to be consulted in the case of certain types of proposed construction or development for the issue of a No Objection Certificate to the BMC. The BMC also collects repair cess which is a percentage of the rateable value of the property and the proceeds are utilised for carrying out essential repairs to privately owned old buildings which the owner has failed to maintain properly. While some experts think that the scope and coverage of the repair cess can be enlarged to make it contribute substantially to a Conservation Fund, some others are of the view that the operation of the Repair Cess Scheme has posed an increasing danger to the continued existence of old buildings particularly those which can yield valuable wood etc. as salvage material. In my discussions with the Chief Engineer Bombay Municipal Corporation I was informed that the BMC had already started acting in the interest of conservation of old buildings/monuments though the proper listing of such buildings/monuments had yet to be completed and their location transferred systematically on the Master Plan. According to the Chief Engineer when an application for construction is received in the BMC the Survey Section scrutinises it first and gives appropriate remarks regarding the operation of development conrols keeping in mind the requirements of conservation. The following 5 examples were cited —

EXAMPLE I: In the case of Fort House. BMC accepted the plea for the retention of the character of the building.

EXAMPLE II : In the case of the electric substation in the compound of the American Express buildings the requirements of conservation were kept in mind.

EXAMPLE III : In the case of a hospital building the demolition of the old building was not approved in the interest of conservation.

EXAMPLE IV : In the case of Mania Hajni Tomb environs the objections made by the conservationists were looked into by the Environmental Protection Group consisting of well-known conservationists.

EXAMPLE V : *Ban-Ganga Precincts*.—There was a proposal to fill up half of the area of the tank and sell it as reclaimed high value land. In the interest of conservation and environment BMC asked the concerned engineers not to proceed with the project and got the proposal stopped through the intervention of the Chief Secretary.

On the point of acceptance of the list of buildings and places of historical importance prepared at the initiative of INTACH the Chief Engineer seemed to think that the procedure to be followed would be for the list to be first scrutinised by the Save Bombay Group (an informal group of enthusiastic and well-known non-officials) which will then obtain the approval of the State Government and thereafter it will be for the State Government to advise the BMC about the acceptance of the list in whole or in part. The Chief Engineer however agreed that detailed zoning regulations would have to be prepared by the BMC at the appropriate time and put up to the State Government for approval and the standards of maintenance of historical buildings/places would also have to be prescribed in the municipal bye-laws. When more and more architectural controls were brought within development controls there would be need for more architects in the BMC to administer controls properly.

11.2 At the State level meeting the following important points were made :—

(a) The non-officials expressed the view that generally speaking government authorities failed in maintaining the character of old buildings/places and often there is architectural incongruity between a new construction and the old building. As an example the seventh floor of Bombay Sachivalaya building was mentioned. The design of some of the hotels also came under criticism and it was mentioned certain Central Government organisations the Railways were guilty of constructing buildings of incongruous design and also of ignoring local development authorities. A block of urinals constructed in the vicinity of the famous Victoria Terminus building was cited as an example.

(b) The Convenor of the Bombay Chapter of INTACH referred to two publications brought out by INTACH (Bombay Chapter)—(1) A list of buildings etc. compiled for conservation and (2) A study of vernacular architecture. The concerned senior State Government officer stated that a lot more detailed working would have to be done before the State Government could take any decision on the protection of the buildings listed by the INTACH.

(c) A strong plea was made for setting up an Urban Art Commission for Bombay and it was suggested that the organisations of the Central Government which controlled old buildings/monuments should also have a similar body and monitor the conservation of such buildings, monuments or places.

(d) The BMC has set up a Listing Sub Committee to draw up a list of landmarks in Bombay for purposes of conservation. There is also a Legal Sub Committee which has prepared recommendations for amending the Development Control Rules of the Municipal Corporation of Greater Bombay and also for introducing new legislation. It was mentioned that the Draft Development Plan of the BMC had been handed over by the Government of Maharashtra to a Special Committee under the Chairmanship of Mr. J. B. D'Souza who had no authority to consider and include recommendations for conservation. A plea was made at the meeting that the Special Committee must take into consideration the requirements of conservation.

A casual look at the proposed amendments in the Development Controls and the new legislation which are under consideration of the Maharashtra authorities shows that *many of the ideas have been taken from the recommendations made in the Ford Foundation Project Report of Hyderabad.*

12. Calcutta

12.1 I visited Calcutta on the 13th July 1987 and had discussions with senior officers of the State Government and the CMDA and also some prominent non-officials. The discussion was mainly about Calcutta.

12.2 The city founded nearly 300 years ago has rich heritage of Indo-British colonial architecture but there are buildings with architectural influence of the Portuguese, the French, the Dutch and the Danes who preceded the British. One important fact is that many of the historic buildings of the British period are in the possession of either the Union or the State Government and given a constructive and positive approach to conservation, it should be possible for the buildings most of which are structurally quite sound, to be conserved for their architectural and aesthetic value though in re-use but unfortunately their standard of maintenance leaves much to be desired. Unfortunately the

recent growth in Calcutta has been of an unplanned nature as there was no Master Plan for the city with detailed zonal regulations. It is only now that the CMDA has prepared some Outline Development Plans which were under active consideration of the Government at the time of my visit. Suggestions have been made, in an ad hoc fashion, by experts from time to time about the conservation of the built environment of Calcutta but no systematic effort has been made so far. For example, Mr. Joseph Allen Stein, a leading practicing architect based in New Delhi visited Calcutta in 1986. After inspecting the Dalhousie Square and other ristoric buildings in the city he recommended that the North, South & West of the Dalhousie Square and the appurtenant areas should be under strict conservation while the East side which consists of old buildings of little architectural value (except one belonging to the Central Government) should be taken for redevelopment as a megacentre. Considering the high value of land in the locality much of the re-development may be pay for itself. If the tentative idea is found acceptable in principle the details would have to be worked out and then only a firm view can be taken. Meanwhile as mentioned above, the CMDA has prepared Outline Development Plans under Section 31 of the West Bengal Town & Country Planning (Planning & Development) Act, 1979 for Ward 45 and Ward 63 of the Calcutta Municipal Corporation. The ODP for Ward 45 lists out the buildings which are considered fit for preservation from the historical/architectural and cultural point of view and include, among others, the Raj Blavan, the High Court with South Annexe, St. John's Church and a few other churches, Synagogue, Beth-ale, the Town Hall. the Metcalfe Hall, etc. The ODP both for Ward 45 and 63 spell out the development controls which are imposed under the Plan. Though the ODPs may not go far enough to meet all the requirements of conservation it is certainly a good beginning.

12.3 The following points were made in my discussion with the State level officers and others :—

(a) There should be a separate Act for conservation and the provisions of that Act should prevail over those of others.

(b) In the Centrally aided scheme for setting up the Eastern Regional Cultural Centre in Shanti Niketan (West Bengal) there should be a *Restoration Library* for conservation with adequate facilities for the benefit of the States/UTs in the East.

(c) Wherever possible historical buildings under conservation should be put to adaptive re-use. The experience of the UNESCO in the Middle East shows that by and large the conservation effort is able to achieve success only when it is related to development effort.

(d) According to the recent (1980) policy adopted in the U.K. old houses under conservation are "upgraded". One example is the upgrading of the residential buildings of factory workers with loan advanced by the local government. Though the facilities within the building are upgraded the architectural character is left undisturbed. The subject of upgrading of old houses has been introduced in the Engineering and Architectural courses in the U.K.

(e) Some of the incentives which can be given are : loan to small industries for making materials which can be used in buildings under conservation. Another incentive could be tax rebate for houses repaired under the conservation programme.

(f) Cantonment areas are under the control of the Central Government and the practice has been to exclude them from the planning process of the local bodies. Sometimes the Defence authorities act thoughtlessly and permit incongruous buildings to be constructed. A glaring example is the construction of the 4-storeyed Kendriya Vidyalaya on the outer periphery of Fort William in Calcutta. The land was given by the Defence authorities for the construction of the school.

(g) In the opinion of the non-officials the functioning of the State Archaeological Department which administers the State Act (modelled on the Central Act with agt limit of 100 years) for archaeological preservation is not very satisfactory. The Department has been without a proper Director for the last 3 years. The Department has no engineering unit and entrusts the work of repairs to the State PWD or to private contractors. Lack of professional competence in such repair work has resulted in the disfigurement of some old buildings.

(h) There is more than one Department which deals with urban development in West Bengal. The Development and Planning Department (under Development Secretary) Controls the Town & Country Planning Department, the State Planning Board, the Bureau of Economics and Statistics, the Digha Development Board, the Sunderbans Development Board and the Hill Area Development Board. The T&CP Department looks after the Haldia Development Authority, the Asansol-Durgapur Development Authority, the Siliguri-Jalpaiguri Development Authority etc. The CMDA was earlier under the T&CP Department but is now under the Metropolitan Development Department Metropolitan Development also controls the Salt Lake and Kalyani townships.

(i) It was suggested that the CMDA was in the best position of looking after the conservation programme in Calcutta and the work of detailed survey and listing may be entrusted to the CMDA for better co-ordination. In the districts the work should be done by the local body through trained personnel.

(j) Since the beginning of 1987 a non-official organisation called the Calcutta Forum has come into existence with the blessings of the Deputy Mayor. It concerns itself with town planning and urban management matters and recently addressed itself to the high rise buildings policy.

(k) In the context of re-use of historical buildings mention was made of the old Tea Auction Office in Calcutta which is a beautiful small building and could be thought of for re-use.

(l) It was felt strongly that a study on the lines of the Ford Foundation Project in Hyderabad may be taken up in Calcutta for a systematic survey, listing and categorisation of the historic buildings and monuments, places and precincts which should be brought under conservation.

13. Union Territory of Delhi

13.1 The high rate of growth in population in Delhi, mainly as a result of influx of people from outside in the last 25 years, and the mushrooming growth of unauthorised colonies and jhuggis are well known and in spite of the opulence and the high per capita income the nation's capital suffers from increasing environmental degradation in some areas of the city. The increasing pressure on land has naturally increased the danger to the numerous historic monuments and sites for which the city is famous. The discipline imposed by the Delhi Urban Art Commission also failed to prevent the damage caused by unauthorised colonies and jhuggi-jhompri settlements.

13.2 The first 20-year Master Plan for Delhi ended in 1981 and the revised Master Plan has yet to be approved in detail. Very little was done for urban conservation in the zonal plans prepared under the Master Plan but I was assured by the DDA that in the Revised Master Plan the needs of urban conservation have been incorporated and the prescribed land use takes care of the requirements of conservation in sensitive areas like the Walled City, Lado Sarai, cluster around Nizamuddin, Qutab and Shahajahanabad etc. A Group under the Chairmanship of Commissioner Municipal Corporation of Delhi has been set up for drawing up a detailed conservation plan for Shahajahanabad. However doubts are expressed whether in the absence of a proper urban design concept such detailed plans can be prepared meaningfully. I was told by the concerned Director of the DDA that if the proposed Revised Plan is brought into effect the restrictions on demolition of historic monuments and sites and the regulation of new construction would automatically come into force but it may take anything upto three years to complete the detailed zonal plans and zonal regulations in support of the conservation effort. Such zonal regulations would have to be area-specific. The DDA were quite candid about the fact that certain areas in Sarvapriya Vihar, Malaviya Nagar or Panch Sheel Park, which should have been marked as special areas and kept free of construction activity, were not so marked in the first Master Plan and to that extent irreversible damage to the conservation programme had been caused.

13.3 Except for the functions of the Delhi Urban Art Commission prescribed under the Act (1973) all development controls in town planning in Delhi are exercised by the DDA and the Municipal Corporation of Delhi or the NDMC has practically no involvement in the conservation effort. The DDA has decided to create a small cell in the Perspective Planning Division for looking after urban conservation and I was told that all the 1307 historic monuments (170 of them are protected by the ASI) identified by the ASI in 1911 were visited in course of the survey made for the Revised Master Plan and practically all the monuments were found intact except for the natural wear and tear due to weather action.

On the question of maintenance and repairs of the historic monuments and sites which are not under the protection of the ASI and which are mostly situated on land belonging to the DDA, there was no assurance from the DDA that necessary resources in the shape of funds or technical expertise would be made available for their proper maintenance and neither the FCD nor the NDMC would assume any responsibility in the matter. There are also no prescribed norms for their repair and maintenance and the newly created Department of Archaeology of the Delhi Union Territory Administration is too weak to do anything meaningful in the matter. In spite of their good intentions the NGOs which take keen interest in the heritage of Delhi and talk about it are unable to do anything tangible for their maintenance. The position is unsatisfactory and a systematic plan of action needs to be chalked out for the historic monuments and sites which are not protected by the ASI or which are not included in the special projects (e.g. Nizamuddin, Shahjahanabad etc.). First, the ASI may review the situation to decide whether some more monuments and sites should be brought under its protection. Second, the DDA may intensify its efforts and complete the zonal plans and regulations for urban conservation as quickly as possible and also create a Conservation Fund to be built up with contribution by DDA, different government agencies, industrial houses and other

non-government agencies. Thirdly, a vigorous PR effort may be made by the DDA for persuading industrial houses and other private companies to "adapt" particular monuments and sites for maintenance. Fourthly, a few selected engineers and architects in the DDA may be put through inservice orientation courses in repair and maintenance technique for conservation work and all repair and maintenance work of the monuments may be done under the direct supervision of the trained engineers and architects. Fifthly, the MCD and NDMC may review their municipal bye-laws and make necessary amendments to provide for the special requirements for the maintenance of historic monuments. Sixthly, the MCD and the NDMC may be brought into the picture in the programme of urban conservation in Delhi and there should be greater inter-action and coordination between the DDA, MCD and NDMC. The Ministry of Urban Development will have to play a significant role in effecting this. Seventhly, a review of the National Building Code should also be made on the above mentioned lines and necessary amendments made by the ISI in the Code and given wide circulation in the interest of conservation.

14. Non-Government Agencies

14.1 NGOs have an all important role primarily in the promotion and popularisation of the conservation programme; in public education on the subject; in the creation of a sense of pride in one's heritage and identity; in the mobilisation of resources—financial or otherwise, and in creating an overall atmosphere in favour of conservation. NGOs registered as societies under the Registration of Societies Act may also act as agencies for receiving and funnelling grants-in-aid from the Government and even formulate and execute projects. In the circumstances prevailing in India it will be in the long-term interest of the conservation effort if the NGOs confine themselves primarily to the promotional and educational aspects rather than involve themselves in the holding of real estate or acting as direct conduits of the regulatory functions of the Government. There is great need for NGOs at the national level, the State level and also at local levels (district, town/city, tehsil etc.). This is so because of the very nature of the functions of such organisations—some may be large bodies with headquarters at national level and with branches in different regions or States with well-defined programme of activity well supported by financial and other resources and with multiple programmes of different kinds. Others may be single purpose bodies at the national level with coverage in the States but with limited programmes. Similarly at the State level there could be NGOs of different kinds with varied programmes and at the city or the district level they could be "amenity groups" with a modest programme of educating and enthusing the local people, identifying historic buildings and sites or guarding the interests of conservation by protesting against the decisions of the authorities which, in their opinion are detrimental to the conservation effort. All such NGOs have a part to play and so long as they are genuinely interested in conservation and not using conservation as a "cat's paw" for achieving other goals, their efforts will not go in vain and will certainly help in building public opinion and creating a public consciousness that is so important and crucial for the success of any conservation effort.

14.2 Urban conservation in India is still in its infancy and therefore the number of NGOs in the field is limited though there indications that they are growing in strength. The more well-known NGOs are :—

(i) **The Indian National Trust for Art and Cultural Heritage (INTACH).**—Established in January 1984 and registered as a society under the Societies Registration Act (1860) INTACH is by far the most important and high level NGO with Headquarters at New Delhi and with a network of offices in different States each under a selected local representative. The Governing Council of the Trust is headed by the Prime Minister himself and the ex-officio members include the Chairperson, National Council of Arts and Secretaries of Ministries of Environment, Culture, Urban Development and also the DG, ASI and Director, National Museum, New Delhi. It enjoys considerable financial and other support from the Government and has initiated a number of interesting and useful cultural projects in different States. It has also taken up the listing of historic buildings and sites in most States (in some States the listing has been completed in a number of cities) and the lists will no doubt be considered by the competent authorities at the national and State levels. Other activities of the Trust are, technical conservation assistance to various museums and other institutions in the country, holding of workshops and lectures and other educational and promotional programmes.

(ii) **Indian Heritage Society.**—This is also a registered body which has been in the field for some years with Headquarters at New Delhi and regional "Chapters". It has been doing useful promotional and educational work.

(iii) **Save Bombay Committee.**—This is also registered under the Registration of Societies Act. It has among its members a number of mature and knowledgeable citizens of standing who have been raising their voice effectively in criticizing certain actions of Central

and State Government organisations which went against the interests of urban conservation.

(iv) **Calcutta Forum.**—This is a less formal group which has also become increasingly vocal in protecting the interests of urban conservation.

The list is not exhaustive and there are other small amenity groups in different States which are helping to create public consciousness in favour of urban conservation.

There is no doubt that as the movement grows other NGOs including organisations of town planners, architects and archeologists will come up in support of the conservation effort. It will be useful to have lists of qualified town planners, architects, engineers and archaeologists whose services may be utilised by Government or non-government organisations on payment of certain fixed charges for the services rendered. Some of these registered experts may even form themselves into a consultancy body. In the interest of smooth administration it will be necessary to formulate a set of objectives and norms on the basis of which Government assistance will be available to deserving NGOs. It will be advisable to have a set of guidelines for the utilisation of the services of the registered experts. Once these norms and guidelines are drawn up at the national level there is no doubt that the States will follow suit.

15. **Government of India Agencies**

15.1 **Archaeological Survey of India.**—At the national level the Archaeological Survey of India is the premier organisation incharge of conservation of ancient and historic monuments and sites which are of national importance. The Survey functions under the provisions of Ancient Monuments and Archaeological Sites and Remains Act, 1958. At present about 5,000 monuments and sites which are more than 100 years old and are of national importance distributed throughout the country, are under the protection of the ASI. Established in 1961 and nurtured in the early years by some world-renowned archaeologists the Survey is a well established body with recognised professional competence. In the last few decades certain inadequacies in the functioning of the Survey partly arising out of the complexities resulting from pressure on land and partly due to internal organisational weakness came to notice and in the last 25 years two important Committees have gone into the working of the Survey. In 1964 the Government of India set up a Review Committee under the Chairmanship of Sir Mortimer Wheeler and the Committee submitted a Report making a large number of recommendations which were duly processed. In 1983 an Expert Group under the Chairmanship of Shri Ram Niwas Mirdha, Minister, was set up by the Ministry of Education and Culture and the Group submitted its Report in July 1984.

15.2 The Wheeler Committee made an interesting observation which highlighted the need for the recording of selected domestic period architecture. The observation reads as follows :—

> ".....But there is no doubt in the minds of the Committee that the highest possible priority attaches today, in India as in many other countries, to a record of selected domestic architecture. The ancient houses of India, often wholly or partly of timber, and often displaying the superb craftsmanship for which India is known throughout the world, are disappearing daily. It is fair to prophecy that in ten years it will be too late to record some of the finest examples, whether in singly or in groups. The face of India is changing at an unprecedented pace. Let us at least prepare some worthy record of it. These houses of the 16th, 17th, 18th and 19th centuries cannot, or will not wait.
>
> Here there is a very proper and a very very urgent task for the Survey. Let it enlarge its Temple Survey into a Building Survey, and get to work without delay upon the record of carefully chosen domestic buildings, typical of their various environments. The matter is one in which the Director General might himself give a personal lead. Let him go to the places, like Ahmedabad, Aurangabad, Madras, Delhi itself and, in consultation, select good or typical examples and set his surveyors and photographers to work upon them : producing plans, elevations, details of carpentry and carving, abundant photographs (some in colour) showing houses and shops individually and in their setting. This project is urgent and of the highest importance....."

15.3. There is little evidence of the ASI having re-oriented its approach to conservation in the matter of listing of period architecture to any significant extent and it is obvious that till the norms of the ASI are changed and the desired re-orientation takes place the needs of urban conservation would have to be met mainly by a vigorous enforcement of development controls in town planning and municipal administration. It would be worthwhile to note some of the important recommendations made by the Mirdha Committee and the lacunae noticed in the provisions of the 1958 Act. They deserve to be accepted.

— There should be all-round strengthening of the Survey in staffing both at Headquarters and in the Circles not only for improving professional competence and the quality of work but also for the physical guarding of the protected monuments.

— The conservation Wing has to be strengthened considerably and qualified

architects should be inducted as conservation assistants side by side with diploma holders in civil engineering and a system of in-service training should be devised.

— There should be at least one *Sthapati* attached to each Circle. Besides attending to repair work he would be the best qualified person to train masons in intricate stone work.

— Traditional craftsmanship is fast dwindling. The stone-cutting workers are not available in the open market. They should therefore be trained and retained in the Survey.

— A Special Cell should be created under Director (Conservation) for working out the rates of various items of conservation work undertaken at archaeological monuments. The existing practice of preparing estimates on rates operated by PWD has been found to be not practicable.

— A revised Conservation Manual incorporating the experience gathered in the last 60 years since the Conservation Manual was first published, should be prepared urgently. Among other things it should spell out the norms and techniques on usage of monuments, environmental conservation, area development etc.

— The Survey should prepare popular literature on the monuments and make them available for sale.

— With increasing involvement of other Ministries the composition of the existing Central Advisory Board on Archaeology should be reviewed.

— A Committee of Secretaries of the Ministries of Culture, Urban Development and Environment should be constituted wherein problems of common interest like air and water pollution, area development, land use plan around monuments and development of tourist facilities may be discussed and decided upon.

— The 1958 Act should be amended for enabling the formulation of suitable guidelines for ensuring historical character and environmental balance of the monument.

16. **Other suggestions**

The concept of declaration of national importance was introduced in 1951 but there is no clearly laid down criteria for determining the level of importance of the monuments. This has to be rectified.

— In the Preamble to the 1958 Act the use of the term "conservation" instead of "preservation" may be more appropriate in the context of the need for regulation of development activity around monuments and sites.

— Today a historic building is regarded as a part of its setting. Therefore the definition of monuments and sites should fall in line with the definition adopted by the International Council on Monuments and Sites (ICOMOS) which is as follows :—

"(a) The term 'monument' shall include all structures (together with their settings and pertinent fixtures and contents) which are of value from the historical, artistic, architectural, scientific or ethnological point of view. This definition shall include works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave-dwellings and all combinations of such features.

(b) The term 'group of buildings' shall include all groups of separate or connected buildings and their surroundings, whether urban or rural, which, because of their architecture, their homogeneity or their place in the landscape are of value from the historical, artistic, scientific, social or ethnological point of view.

(c) The term "site" shall include all topographical areas and landscapes, the works of man or the combined works of nature and man, including historic parks and gardens, which are of value from the archaeological, historical, aesthetic, ethnological or anthropological point of view.

— The age limit of 100 years which appears to have been adopted since 1904 needs to be lowered in view of the present perception of urban conservation. A reasonable cut-off limit may be 50 years as adopted by some countries. Even within India some States have found it rational to adopt a lower age limit.

— In view of the experience with regard to re-development around Jantar Mantar in New Delhi (there are many other similar instances in the country) there should be a legal provision made in appropriate terms making it obligatory on the competent urban development and municipal authority to obtain a No Objection Certificate from the Survey before sanctioning any re-development project in the vicinity of a protected monument or site of national importance particularly with reference to the setting of the monument and construction of high-rise buildings. It may also be enjoined that no development whatsoever

takes place within a certain minimum distance from the manument. This distance can be laid down in respect of different monuments and sites by the National Commission of Built Environment or the State Urban Art Commission, as the case may be, and duly notified under the law.

17. **Central Public Works Department**

17.1 This is the largest and most important works department of the Government of India which constructs and maintains both residential and non-residential buildings of the different Ministries and also organisations of the Government of India except those which have a separate civil works wing of their own. The CPWD has Zonal Offices in charge of Chief Engineers in the different regions of the country. It has also a full-fledged Architectural Wing under a Chief Architect. There is a CPWD office in practically every State and has a common Civil Works Code which is administered by the Head of Office in Delhi. The well-knit nature of the body makes it possible to implement major policy and operational decisions throughout the country and obtain necessary feedback. Some of the very important buildings maintained by the CPWD are, the Rashtrapati Bhavan, the North and South Block Secretariat, Houses of Parliament, the Hyderabad House and the Teen Murti House, all in New Delhi; the National Library, the Victoria Memorial Hall, the Metcalfe Hall and the Indian Museum, all in Calcutta; the Viceregal Lodge in Shimla and the Retreat in Mashroba near Shimla and so on.

17.2 While meticulous care is taken for obvious reasons, in the maintenance of prestigious buildings like the Parliament House or the Rashtrapati Bhavan in consultation with experts whenever necessary, the standard of maintenance of other buildings is mostly dependent on the availability of adequate funds and sometimes even if funds are available work of a specialised nature gets neglected for want of expertise in that particular field. For example, in 1982 it was brought to the notice of the Ministry that a marble balcony in the Victoria Memorial Hall had fallen down due to weather action over a period of 3-4 years. The mishap could have been prevented if timely action had been taken to repair the marble slabs which had become loose due to action of humid weather and the monsoon but the local CPWD officers had not taken up the work on the plea that no expert marble joiner was available in the Department. It was only after a marble expert was seconded by the ASI for a period of 5-6 months that all the items of marble work could be attended to properly.

17.3 As for maintenance standards, the existing Rules permit senior engineers at certain levels to approve higher rates for repair/maintenance of selected important buildings but it cannot be said that the special requirements of maintenance of old buildings which generally abound in stone, high quality wood work, marble, etc. are invariably taken care of by the Rules. Much depends on the initiative taken by the concerned engineer or architect. This position has to be rectified and a special schedule of rates should be drawn up for the repair and maintenance of the old buildings under conservation and the special rules must provide for not only the special materials that may be required but also higher wages that may have to be paid to skilled artisans and craftsmen whose services are not easily available.

17.4 Secondly, it is of very great importance that engineers at all levels and architects involved in the work of repair/restoration of old buildings are put through an appropriate in-service course of training in conservation principles and techniques. The courses should be designed by the Director General ASI and run in different regions of the country. I was assured by Director General (Works) CPWD that the Department would have no difficulty in making full use of such courses of training.

17.5 Considering heavy responsibility cast on the CPWD for the proper conservation of the buildings in its charge the Department would be well advised to earmark a very senior officer—preferably one of the Additional Directors General—if it cannot be the DG(W) himself, to head a small standing committee within the Department consisting of the DG(W) as the Chairman and the Chief Architect and a selected Chief Engineer as member, to review the proper maintenance of old buildings according to the approved standards in conservation and take decisions across the table on issues which may be borught up from the different regions of the country from time to time. It should also monitor the proper implementation of the training programmes.

17.6 Perhaps in recognition of the fact that the maintenance and up-keep of some of the important and prestigious buildings need special care, the Ministry of Works and Housing (now called the Ministry of Urban Development) constituted in July 1985 through an Office Memorandum vide copy of O.M. No. 21015/51/83-WI, dated the 11th July 1985 at Enclosure F) a Committee under the Chairmanship of the Minister of State for Personnel & Training etc. consisting of Shri Charles Correa, a well-known architect and a few others and with Shri Harish Chandra, Chief Engineer (NDZ), CPWD (now Director General (Works) CPWD) as the Member-Secretary to advise Government on the matters connected with the "maintenance and modifications" to the Rashtrapati Bhavan, North and South Blocks and the Parliament House buildings. However it is understood that several other buildings including some of the old Raj Bhavan buildings have been brought under the purview of the Committee which advises not only on the maintenance but also about the interior decor, furniture and furnishings. If, as a result of the

last two years experience it has been found that the Committee's terms of reference should be expanded it is only appropriate that a revised order be issued spellings out all the functions of the Committee.

18. **Posts & Telegraphs**

18.1 The Secretaries of the two Departments—Posts and Telecommunications and their senior colleagues on the civil engineering side assured me that the Departments had now become quite conscious of the need to conserve the character and aesthetic beauty of some of the fine old buildings which have been inherited by them from the British days. They however said that such consciousness was a very recent phenomenon and the process of orientation of the concerned engineers and architects had still to be completed.

18.2 On the Postal side the following are some of the important old Post Office buildings :—

(i) Calcutta G.P.O. (Secretary Postal Department told me how the Postal Department had changed their plans of construction of a high-rise buildings behind the Calcutta GPO in deference to the objections raised by CMDA and others in Calcutta).

(ii) Podanur Post Office (5 miles from Coimbatore).

(iii) Bombay GPO—in Gothic style.

(iv) Ooty H.P.O.—wooden structure. Nearly 100 years old. Pretty looking.

18.3 I was told that a systematic listing of buildings had been taken up.

19. On the Tele-communications side the old CTO, Calcutta (how housing the Dead Letter Office), the Telephone Office in Dalhousie Square (originally a European Club), the Bombay Telegraph Office, The Eastern Court in New Delhi and the CTO in Kashmeri Gate were cited as good examples of old buildings. I was assured that there was no problem of funds for maintenance and the Department had a Chief Architect at Headquarters and Senior Architects in regional offices and other important places and they would organise themselves to ensure the proper maintenance of these old buildings. Both Secretary Posts and Secretary Tele-communications enthusiastically accepted the idea of in-service training in conservation for all functionaries involved in the repair/maintenance of old buildings. They said that their Departments would gladly bear the cost of such training for their officers. They also responded positively to my suggestion that a senior officer in the Departments should be earmarked and given the responsibility for the weaving the maintenance of old buildings and the training programme.

20. **Railways**

20.1 The Member Engineering, Railway Board, Mr. M. N. Prasad and his senior colleagues including Chief Engineer (Central), Northern Railway and the Executive Director (Land Management) Railway Board, assured me that though in the past some incongruous constructions violative of architectural and aesthetic norms had been made at a number of places (example : Madras Central Station—new construction towards the office side) the Railways had become very keen about conservation now and as a part of the Centenary Celebrations the new Chairman Railway Board (Mr. Jain) had initiated a Model Station Scheme under which selected railway station buildings were to be repaired and restored to their original glory and 67 stations had been selected all over the country for the purpose. The Regional Railways were expected to prepare Master Plans and only the broad features of the Plans were to be approved by the Railway Board. However a letter had been sent out under instructions of the Chairman, Railway Board cautioning the regional offices against any hasty or over-enthusiastic action. On my request the Railway Board furnished a list of railway buildings included in the conservation programme (vide list placed at Enclosure G). The list is however incomplete in respect of the Central, North, Eastern and South Central Railways.

20.2 On the point of maintenance I was told that important or prestigious buildings or "service buildings" like hospitals etc. were given preferential treatment in the sanction of rates though all work was done through Zonal Directors and never departmentally. I was also informed that the Department had an Architectural Wing under the Research, Designs and Standards Organisation in Lucknow but the entire Wing was disbandeed under the orders of Government as it was felt that the Wing consisting of 7 officers (Director Architecture plus 6 Architects in different ranks) and 45 other staff had become stagnant and was unable to contribute much. Nothing has taken the place of the Architectural Wing so far and the idea seems to be to engage private architects in an *ad hoc* manner as and when necessary. The railway officers were unable to give any satisfactory answer to my query as to how the day-to-day work requiring the advice of architects would be carried on in the absence of any architectural organisation. An idea which seemed to be gaining ground was that a few "architectural officers" could be kept on the rolls of the Railways to advise on the rates and terms etc. for the engagement of private architects by individual Railways. Though the details had not been worked out it was very likely that the engagement of private architects on a continuing basis would work out to be more expensive than having an architectural wing in the Railways itself. This seemed to be a case of throwing the baby along with the bath waters.

20.3 On the point of construction of incongruous buildings I mentioned to Miinister Railways (Shri Scindia) and later to Member Engineering

Railway Board about the complaints made by the members of the Save Bombay Group at a meeting held in Bombay that the local officers of the Railways had been quite insensitive to the development controls and municipal bye-laws administered by the Bombay Municipal Corporation and an unsightly building had been constructed behind the famous Victoria Terminus. I also mentioned that changing the external colour scheme of the Howrah Railway Station building did not reflect good aesthetic sense and there had been criticism among discerning people in Calcutta.

20.4 On the point of in-service training Member Engineering Railway Board enthusiastically agreed to the suggestion that such in-service orientation or training courses be organised by the ASI and concerned officers of the Railways at working levels (Assistant Engineer/Inspector of Works) would be sent for such training at the cost of the Railways. As regards the training of higher level officers I was informed that the Railways were in touch with the Delhi School of Planning and Architecture and some courses in architecture, aesthetics and conservation of environment were being planned for officers of the level of Superintending Engineer and above. The period of such a course would be about 2 weeks.

20.5 In the Railways also as in the case of CPWD and the Posts & Telegraphs Department I would recommend the setting up of a high level Conservation Cell within the department for purposes of monitoring the work of maintenance of old buildings and the progress of training programme.

21. Defence Estates

21.1 The Defence Estates and the Defence service organisations between them control something like 310 cantonments or military stations throughout the country. This is more than 10 per cent of the total number of towns and cities in the country and is undoubtedly a large chunk of area with growing urban population crying for proper urban management.

21.2 In the absence of proper identification and listing of old buildings it is difficult to say exactly how many old buildings of colonial or even pre-colonial vintage are there in the 60-odd cantonments and 250-odd military stations but it would be quite safe to presume—as appeared from my discussion with Defence Estates officers and senior Army Officers—that some of the old cantonments like Barrackpore near Calcutta (probably the oldest cantonment) and Fort William, Calcutta, Wellington (Tamil Nadu), Mhow and Jhansi (M.P.), Dalhousie (H.P.), Lansdowne and Ranikhet (U.P.) and Hyderabad (Golkonda) have some beautiful old buildings deserving to be brought under conservation. There are also some old residential buildings in the cantonment areas associated with historical personalities which again would be important enough to be conserved.

21.3 The concept of conservation is entirely new to the Defence authorities. I was assured that the MES which operates a schedule of rates modelled on the CPWD rates does maintain the old buildings though the standards adopted may not be strictly in line with those approved for conservation purposes. There was, if anything, too much of "spit and polish" and in the process one would not be surprised if some of the old artifacts got rubbed off. The question is really one of training the MES staff and this can be done by organising short-term courses in conservation through the ASI in some manner as for other Government of India organisations. Simultaneously, a systematic listing of all the buildings will have to be done. I gave a copy of the proforma prescribed by the INTACH for such listing to the QMG and he promised to follow it up.

21.4 However a more serious problem which needs to be tackled at the policy level with some determination is to ensure that the military stations numbering more than 250 which have come up since Independence are not permitted to degenerate any further into centres of unplanned urban growth with rampant environmental degradation. Conservation at the city level presupposes the existence of proper urban planning and urban management in order that a worthwhile urban life is assured to the residents. There seems to be a sharp difference of opinion between the Defence Estates officers (civil) and the service organisations particularly the Army over the status of these military stations. The Defence Estates people feel that unless the new military stations are declared as cantonment areas they cannot have the facility of municipal administration. Under Article 246 of the Constitution read with Entry 3 of List I and Entry 5 of List V of Schedule VIII, the Central Government is empowered to legislate on matters of local-self government and civic affairs only when an area is declared as cantonment. Once it is so declared, under Section 3 of the Cantonments Act, 1924, (last amended in 1983) the provisions of that Act would apply automatically. In the case of military stations not declared as cantonments Defence authorities have no powers under the law to regulate municipal affairs of the shanty towns which inevitably mushroom around the military stations with the result that the growth of such shanty towns on private land is totally uncontrolled and results in urban degradation over a period of time and poses a threat to the health, hygiene and discipline of the troops who cannot be prevented from visiting the shanty towns for meeting numerous requirements. In an *ad hoc* manner the authorities of the military stations may provide certain essential facilities like water supply but no systematic municipal administration is possible

and no municipal levies in the shape of taxes can be imposed on the civil population by the Defence authorities and whatever expenditure is incurred becomes an unnecessary burden on the Defence budget. Secondly, in the absence of a cadre of town planners/architects with the Directorate of Defence Estates, the 60-odd cantonments are deprived of the benefit of modern urban planning and management except in the case of a handful of cantonments which have commissioned private consultants for drawing up plans etc. If all cantonments cannot afford the luxury of having a town planner and an architect, a small cadre could be created at Headquarter level and at the Command level and the services of such town planners/architects could be made available to different cantonments as and when necessary.

22.1 Historic and old monuments and ancient sites provide many of the major tourist attractions in India and over the decades the ASI has been working hand-in-hand with the tourist Development Departments and Corporations. Starting with the Taj one can go through the long list of temple complexes throughout the length and breadth of the country, the old forts, the places of Buddhist pilgrimage and even the small but picturesque temples with their beautiful idols and the monasteries in Lahul and Spiti. The list is unending. Apart from the major items of national importance which are under the protection of the ASI, a number of temples and the buildings of tourist importance are in the charge of the concerned State Departments of Archaeology. Even conceding that the development of infrastructure for providing additional facilities to tourists and attracting a larger tourist traffic may not always be in the best interest of conservation of old buildings and old monuments, the tourist development projects have by and large helped in drawing attention to the neglected condition of some of the old monuments, buildings and places and generally helped in the improvement of the environment and up-keep of such places. The Seventh Five Year Plan (1985-90) of the Department of Tourism of the Government of India lays a lot of emphasis on the development of a number of cultural tourism centres. To quote from the Plan documents :—

> "In the Fifth Plan the Department of Tourism initiated action on the development of a number of cultural tourism centres. The major thrust of the Department has been the preservation of the environmental and natural setting of archaeological complexes, to ensure that the surroundings of these monuments are not spoiled by unplanned and unregulated growth and to develop requisite facilities at these centres. As a first step towards the development of these centres, preparation of Master Plans (land use plans) of some of the above centres was undertaken through the Town & Country Planning Organisation of the Ministry of Works and Housing. The Master Plan includes physical planning of the area of development, the location of tourist facilities to be provided in these areas and measures for environmental improvement and control in order to ensure pleasant surroundings and maintenance of the ecological plans. More recently, the National Institute of Design has prepared some Master Plans for the Department. The NID plans in particular have broken new ground by including micron plans for the proposed tourist facilities, paying attention to traditional architectural forms and designs, local environmental features, details of the interiors based on local arts and crafts, signage, the kinds of trees to be planted, the layout of the landscapes and the walkways etc. The four sites/areas for which the NID plans have been prepared—(1) Fatehpur Sikri; (2) Braj Bhumi; (3) Koshinagar and (4) Shravasti,—have been designated National Heritage Projects and are under various stages of implementation".
>
> "It is proposed to take up at least 10 cultural tourism master plans in the Seventh Plan as National Heritage Projects. The specific plans to be taken up will be selected by the Co-ordination Committees which meet from time to time under the Chairmanship of Minister of Tourism and Minister of Education & Culture. The cost of each plan including the acquisition of land both for conservation and the construction facilites works out typically at an average of Rs. 1.5 crores. Allowing for spill-over of the Eighth Plan an amount of Rs. 11 crores has been provided for the purpose. In addition, there will be other cultural tourism centres of national importance where some tourist facilities and some environmental development may be necessary. A sum of Rs. 2 crores is being provided for such centres".

22.2 The National Heritage Projects, if properly implemented, will go a long way in the conservation of environmental and natural setting of the different archaeological complexes. The Department has also carried out studies on the development of places associated with the life and teachings of the Buddha mainly in the rural areas and there is a scheme for provision of facilities for tourists at a number of monuments and sites (cultural centres) under the control of the ASI. The Department of Tourism has also sanctioned Rs. 64 lakhs for the development of Varanasi Ghats on the pattern of Hardwar. Out of this amount Rs. 43 lakhs has already been released and the work is being executed by the State Government. In addition, the Department of Tourism uses some well-known buildings like the Red Fort, the Teen Murti House for the Son et Lumierie (sound and light) purposes and this helps in the maintenance of the buildings. With a little imaginative use of the funds provided by the tourism development departments and given

proper understanding between the tourism development department and the other departments in control of the old buildings and sites and a little innovative approach to the "re-use" of the old buildings a fair amount of support can be found for the conservation effort in this sector. The State Tourism Development Departments or Corporations could similarly be persuaded to lend support to the conservation effort though except for a few large States the financial resources available for the purpose will not be much.

23. **Ministry of Environment & Forests**

23.1 The recently created Ministry of Environment & Forests in the Government of India has put on the statute book a comprehensive law for the protection of the environment called the Environment (Protection) Act, 1986—Act No. 29 of 1986. This comprehensive legislation gives wide powers to the Central Government and provides for the planning and execution of a nation-wide programme for the prevention, control and abatement of environmental pollution. Specific provisions have been made in the location of industries. Among the factors to be taken into consideration in imposing prohibition and restriction [vide Rule 5 of the Environmental (Protection) Rules 1986] :—

(i) Environmentally compatible land use;

(ii) proximity to a protected area under the ancient Monuments and Archaeological Sites and Remains Act, 1958 or a Sanctuary, National Park, Game Reserve or a closed area notified as such under the Wild Life (Protection) Act, 1972 or places protected under any treaty, agreement or convention with any other country or countries or in pursuance of any decision made in any international conference, association or any other body.

(iii) Proximity to human settlements.

(iv) Any other factor as may be considered by the Central Government to be relevant to the protection of the environment.

23.2 The pollution sought to be controlled under the Act are water pollution, air pollution and noise pollution. The Act also provides for hefty punishment for failure to comply with or contravention of any of the provisions of the Act or the Rules or orders or directions issued thereunder. Each such failure or contravention is punishable with imprisonment for a term which may extend to 5 years or with fine which may extend to Rs. 1 lakh or with both and in case the failure or contravention continues additional heavy fines are to be imposed.

23.3 Considering that 80 per cent of the water pollution in urban areas is caused by the imperfect disposal of human waste and the control of pollution is essential for proper urban management and decent urban existence any strong legislation for the protection of the environment by effective control of pollution is of great importance and significance to any worthwhile conservation programme. It can therefore be reasonably expected that the new Act for the protection of the environment will provide a strong base for effective and meaningful action by the Central Government. Unfortunately, the record of performance of the majority of the State Pollution Control Boards has so far been extremely disappointing largely due to the organisational weakness of the Boards resulting from the wrong choice of people constituting the Board and non-professional manner of working of the Boards which have often proved themselves to be too weak to resist pressures from interested quarters. Lack equipment and laboratory facilities and financial weakness have been the other crippling factors.

23.4 In acceptance of the fact that built environment is also very much a part of the total environmental picture, the Ministry of Environment has been taking active interest in certain issues connected with enforcement of development controls and growth of new urban areas. A few examples are :—

(a) F.S.I. (Floor Space Index) in the island city of Bombay;

(b) Naval constructions at Colaba, Bombay;

(c) F.S.I. in cantonment towns;

(d) Guidelines for new towns; and

(e) Environmental guidelines for military stations.

This is a welcome development.

CHAPTER IV

INSTITUTIONAL AND ADMINISTRATIVE ARRANGEMENTS

1 In Chapter III, I have attempted to give an idea of the role of the Government, semi-Government and non-Government organisations in the urban conservation effort both at the Centre and in the States visited by me. I have also commented, in passing, on some of the short-comings and inadequacies in the arrangements. In this Chapter I propose to deal with the functioning of the institutions more pointedly with a view to suggesting what steps should be taken to improve the institutional arrangements to make them function more efficiently, cohesively, more purposefully and with a sense of direction.

1.1 In the Government of India if one looks at the Allocation of Business Rules the Ministries primarily concerned with urban conservation are : Urban Development, Department of Culture (Ministry of Human Resource Development), Environment & Forests and the Department of Tourism though, considering the complex nature of urban affairs the activities of some other Ministries like Transport, Commerce, Railways, Communications, Planning, etc. have their impact, directly or indirectly on urban management and therefore on urban conservation. At the State level the corresponding Government Departments would be Education/ Culture (for Archaeology), Urban Development, Tourism, Pollution Control etc. It will perhaps be no exaggeration to say that till about a decade ago, hardly any Ministry took any planned cognisance of the requirements of urban conservation and practically the entire conservation effort confined to the protection of archaeological finds and ancient and historical monuments and sites was in the hands of the ASI. Consciousness about the need for urban conservation has grown in the last few years both in Government and non-Government circles and a very pertinent question has arisen : What should be the role of the Government of India in providing leadership and guidance and other assistance to the States in the matter even though town and country planning and urban management are State subjects? For an answer one has to look to the circumstances which led to the enactment of the Environment (Protection) Act, 1986 by Parliament. Urban conservation in the wider sense is very much a part of the protection of environment and the considerations which led to the Government of India assuming leadership in the protection of the environment very much apply today to the area of urban conservation also. Though in some of the advanced States action has been initiated for urban conservation through town planning regulations the progress has been halting and haphazard and perhaps some major policy decisions taken at the national level will give a sense of direction to the States and enthuse them to make appropriate institutional arrangements to support the effort on a sustained basis. Compared to the ASI the State Archaeological Departments are very pale and weak imitations of the Central organization, lacking woefully in staff, expertise and financial resources. Therefore the thrust in the States and UTs will have to be primarily in the sphere of formulation and enforcement of development controls under town planning and municipal administration. Simultaneously the Departments of Archaeology would have to be strengthened in their capability but that may take time. Continuous guidance and monitoring by the Union Ministry of Urban Development and the Central T&CPO would be required to see that the States build up the Development Authorities and the local bodies to perform this function efficiently. Unfortunately except for a few Area Development Authorities or Development Authorities in big cities which enjoy liberal grants from the State Government or have developed fund raising capacity through sale of land or real estate development, the vast majority of the local bodies (municipalities) function at a very low level of efficiency practically living from hand to mouth on doles (grants-in-aid) from the State Government and continuously plagued by the behaviour of indisciplined and politicised staff. Many municipalities do not have the minimum qualified staff even to enforce the building bye-laws and other elementary municipal controls with the result that the citizens are left at the mercy of a rapacious clerical brotherhood. On the other hand the less law abiding of the residents are left free to violate the law in the shape of encroachments and unauthorised constructions leading to congestion, confusion and utter mismanagement of civic affairs. The income and expenditure statement of the municipalities in Himachal Pradesh (refer note on Himachal Pradesh in Chapter III read with Enclosure A) gives an idea of the position in one State. The position will not be different in many other States. Considering the new development schemes which many municipalities are expected to implement properly it is essential to ensure a minimum level of efficiency in the functioning of these local bodies. This is not going to be an easy matter but it is not impossible and can be done with resolute action on the part of the State Governments with the willing co-operation of

the people. The local bodies must not be made to feel that their existence depends on doles from the State Government in the shape of grants-in-aid which may vary from year to year but there should be a realistic system of devolution of funds to be determined on the recommendation of Municipal Finance Commissions. The question of resources of the urban local bodies and municipal corporations has been exercising the mind of the Ministry of Urban Development Government of India for some time and the All India body for Local Government and Urban Development has been stressing the matter in meeting after meeting every year. At the 23rd meeting of the Central Council for Local Government and Urban Development and the 12th Joint Meeting of the Central Council for Local Government and Urban Development and the Executive Committe of All India Council of Mayors at their meeting held in New Delhi in October 1986 had no less than 23 items under 'resource mobilisation' for discussion at the meeting. With the abolition of octroi in State after State the prospects are becoming even bleaker for the municipal bodies. It is important that firm decisions are taken on making the municipal bodies viable and efficient. In the process some unpalatable decisions may have to be taken in respect of the dead wood among the staff and discipline will have to be imposed and professional competence improved, if necessary with managerial subsidy from the Government. All these need to be done urgently in a planned manner.

1.2 Urban Art Commissions, charged with the responsibility of promoting urban conservation and urban aesthetics have an important role to play. In all States they are advisory bodies created under the provisions of some Area Development Authority Act and in Orissa and Andhra Pradesh I was told it has become quite ineffective and almost non-functioning. The Bangalore Urban Art Commission is somewhat more active but is yet to achieve any concrete results except for its stand against the demolition of the 18-Kutcherry building. The Delhi Urban Art Commission set up under the Delhi Urban Art Commission Act, 1973 (No. 1 of 1974), clothed with statutory functions and powers in respect of approval of plans for development activity in Delhi and also in respect of re-development of certain areas and the conservation, preservation and beautification of monumental buildings, public parks, etc. under Section 11 of the Act, has a better track record but unfortunately it has received rather cavalier treatment at the hands of the Delhi Development Authority and one cannot say that it has really functioned as a controlling authority so far as urban conservation in Delhi is concerned.

1.3 Apart from strengthening the local bodies as suggested above the Government can, with a slight modification of the existing schemes, promote the cause of urban conservation. The Central sector scheme of the Integrated Development of Small and Medium Towns (IDSMT) under the Ministry of Urban Development provides for Central assistance on a matching basis to States for selected small and medium towns for the development of housing, communication and economic activity (mostly markets) and low-cost sanitation. Under the Sixth Plan 235 such towns were taken up and a further 102 towns have been approved under the Seventh Plan (1985-90) with a total outlay of Rs. 88 crores in the Seventh Plan. The Scheme can be slightly modified to include urban conservation programme also and assistance on a matching basis could be given to the States for specified additional items. The scheme provides a foothold for the Government of India to examine the total development plans of these towns. Expansion of the scheme to cover more towns and cities of different sizes for supporting the work of survey and identification of historic monuments and sites could also be thought of for the Seventh and Eighth Plans.

1.4 The Urban Information Scheme (URIS) could also be implemented more vigorously to provide a country-wide data base for purposes of monitoring the progress of town planning in the entire country. As the first step towards development the attempt should be to have a plan for every town in the country. This will go a long way towards ensuring the basic conditions for conservation at the city/town level. Very often the location of government buildings prepare the ground for unplanned growth of towns. For example, in a town which becomes the Headquarters of a newly sanctioned sub-division carved out of a district or a bigger sub-division, numerous office buildings for the use of the General Administration and the local officers of different development departments have to be constructed. Experience shows that no thought is given to land use in the construction of such buildings and the attempt is to construct them cheek by jowl with residential areas for the convenience of the office goers, thereby fouling the residential colony completely with ever-increasing traffic and congestion. If there is a body at the State level looking after urban conservation every such proposal for the development of a new town be it a sub-divisional or district Headquarters or an industrial township, must have the approval of such a body.

2. At the national level there is a need for a body which will act as the guardian of the interests of urban conservation and also be the nodal agency for the different Ministries of Government, not merely for the purpose of acting as a clearing house but for :—

- Giving advice at the Minister's level;
- Taking decisions on identified areas of responsibility including a programme of listing of historic monuments and sites;
- Organising research and educational prpammes and public information; and

— Giving an Annual Report on the conservation effort.

It may also receive gifts and donations but not take the responsibility, at least in the initial years, for the direct management of real estate which will be the responsibility of the ASI. The body may be called the National Commission of Built Environment and may be set up by an Act of Parliament after there is an all-Party (political) agreement on the basic principles.

— The body may consist of : eminent Indian citizens (minimum age 45 years) who have distinguished themselves in their own field of activity and may be scientists, archaeologists, town planners, jurists, administrators, architects, engineers or academicians. It may be wise to exclude Members of Legislature and politicians.

— The term of the Commission may be five years and should be constituted by an Act of Parliament.

— The Secretaries of the Ministries of Urban Development, Culture and Environment and also the Director General of ASI may be ex-officio members of the Commission, the size of which may be limited to about 12.

— The Chairman and the members, except the ex-officio members should be full time members of the Commission and the conditions of service should roughly correspond to those of Supreme Court Judges for the Chairman and High Court Judges for the other members.

— Once appointed the Chairman or the members will not be removeable except by following a procedure similar to that applicable to a Supreme Court Judge or a High Court Judge.

— The Commission will have four Regional Offices for purposes of liaison with the States and monitoring the developments in different States.

— The advice of the Commission will not be limited to the listed historic buildings and sites but also to other period architecture and sites which may be under the control of the Central Government Ministries and Organizations. The Government may also, by a suitable Resolution, entrust specific owrk to the Commission connected with urban conservation.

— The physical work of survey and listing of historic buildings and sites will be done by the ASI on the basis of guidelines laid down by the Commission.

— The work will normally be done by a team consisting of trained personnel representing the disciplines of archaelogy, town planning, civil engineering, architecture, land administration and municipal administration.

— Proposals for listing received from different Government or non-Government organization will be duly scrutinised by the ASI after gathering such further information as may be necessary. The procedure for listing and the statutory functions of the National Commission in matters connected with listing have been suggested in Chapter 5 "Survey and Listing".

2.1 As the National Commission will be directly concerned with more than one Ministry it may be constituted by the Cabinet Secretariat or the Ministry of Environment which will be its Ministry for administrative purposes. The Commission will however report direct to the Minister of the concerned Ministry and not through its administrative Ministry.

3. At the State level the functions of the Commission may, *mutatis mutandis,* be discharged by a high level statutory State Urban Art Commission set up under an Act with a Chairman of the status of a High Court Judge and with 7 other members including three ex-officio members, namely, Secretary Urban Development, Secretary Environment (if any) and Secretary Culture (or Education as the case may be).

— The qualifications for non-official members will be similar to those suggested for the National Commission.

— The powers and functions of the State level Commission will be defined in the Act and though it will be an advisory body so far as the State Government Departments are concerned, it will have statutory functions as suggested in Chapter 5 "Survey and Listing" and other statutory functions as may be decided by the State Government.

— The State level Commission may be constituted by the Department of Urban Development in the State and in the initial years it may be advisable for the portfolio of Urban Development to be kept by the Chief Minister.

3.1 The above recommendations about setting up of a National Commission are broadly on the lines of Australian Heritage Commission.

4. It is important particularly in the formative years to create public consciousness and a proper atmosphere in favour of urban conservation. A national consensus at the political level is expected to help in creating such an atmosphere but it is important that in a federal system the functionaries both inside Government and outside handle the inter-action with the States will great care. The attitude from the Centre has to be one of help and guidance and not of superiority. Costly ventures should not be recommended to the State Governments without proper scrutiny as it may result in exposing the State Government functionaries to attack by critics.

CHAPTER V

SURVEY AND LISTING

1. In the entire process of conservation of built heritage it is of very great importance that the agency which is given the responsibility of listing and grading follows some uniform principles based on objectivity and professional scrutiny which would inspire confidence among the affected people and reduce the controversy to the minimum. The matter will be of crucial importance where the building or the land is privately owned and the listing affects the possibility of commercial gain one way or the other in the fast developing urban areas. While non-official organisations (NGOs) like "amenity groups" or bigger bodies may have a valuable role to play in getting surveys done through approved experts and drawing up lists of buildings, places, areas etc. for conservation giving relevant details (in some cases the information may include detailed drawing made at considerable cost), the final scrutiny resulting in the listing and grading of the monuments/buildings/places has to be done by a public authority which would have to be a government or semi-government organisation.

1.1 It is recognised that listing and grading would entail an element of selection and therefore all the historic buildings, precincts, places etc. which are surveyed will not be included in the list though many of the excluded items may, by virtue of their historic or architectural or aesthetic merits, be found fit for conservation in the town planning exercise.

1.2 Conservation at the city level would also include items like wooded areas or water bodies etc. which lend a distinctive character to the city. While all the listed buildings and places in a city would not only come under the town planning and municipal development controls but may also come under the provisions of the Ancient Monuments & Architectural Sites and Remains Act, 1958, the buildings and places not included in the list would not come under the Central or the State Act for the protection of archaelogical monuments and sites but many of them would be included for application of development controls in the city. It follows therefore that the Development Authority or the municipal body would have to act in very close co-ordination with the prescribed authority which does the listing and gradation of the buildings and places.

2. The question arises what, in the conditions obtaining in India, would be the most appropriate authority for the listing and gradation of historic buildings and places. It would be of interest to note that in the U. K. which has been our model for town planning legislation, it is the Secretary of State for the Environment who is required to compile lists of buildings of special architectural or historic interest and furnish them to the local planning authorities for their guidance in the exercise of their own planning functions under the Town & Country Planning Act, 1971. The principles of selection of the lists were drawn up by the Historic Buildings Council (now the Historic Buildings and Monuments Commission) and approved by the Secretary of State. The lists covered four groups:—

All buildings built before 1700 which survive anything like their original condition.

Most buildings of 1700 to 1840 are listed though selection is necessary.

Between 1840 and 1914 only buildings of definite quality and character are listed, and the selection is designed to include the principal works of the principal architects.

Between 1914-1939 selected buildings of high quality are listed.

In chosing buildings, particular attention is paid to:—

Special value within certain types, either for architectural or planning reasons or as illustrating social and economic history (for instance, industrial buildings, railway stations, schools, hospitals, theatres, town halls, markets, exchanges, alm-houses, prisons, lock-ups, mills).

Technological invention or virtuosity (for instance, cast iron, prefabrication, or the early use of concrete).

Association with well-known characters or events.

Group value especially as examples of town planning (for instance, squares, terraces or model villages).

2.1 Buildings are classified in grades to show their relative importance as follows:—

Grade I

These are buildings of exceptional interest only 1 per cent of listed buildings are so far in this grade).

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Grade II

These are buildings of special interest, which warrant every effort being made to preserve them. (Some particularly important buildings in Grade II are classified as Grade II)*.

*Lists compiled about 1970 include a further category, Grade III. This grading is no longer used but Grade III buildings were those which whilst not normally qualifying for the statutory list were considered nevertheless to be of some importance. Many of these buildings are not considered to be of special interest by current standards—particularly where these date from before about 1700 or where they possess group value -and are being added to the statutory lists as these are revised.

3. Keeping in view the historical background of the conservation effort in India and also in the interest of the best utilisation of our resources, I think we should broadly follow the U. K. pattern with certain amendments to suit our conditions. One significant change would be that at the national level the responsibility for listing and gradation would be given to the ASI, strengthened and more broad-based, as recommended in the earlier paragraphs, instead of the work being done either by the Ministry of Urban Development or the Department of Culture (Ministry of Human Resource Development) directly. The procedure at the national level and below may be as follows:--

3.1 **National Level.**—The work of listing and gradation of buildings/monument/places/areas of national importance would be the responsibility of the ASI as revamped for the purpose. The ASI will give an opportunity to the owners of the building or land or any other interested person to file a petition within a specified period and dispose of the objections within a specified period. Detailed guidelines for the procedure to be followed by the ASI would be laid down by the proposed National Commission of Built Environment. The Commission will also be the appellate authority for the hearing and disposing of appeals against the decisions of the ASI in the listing and gradation of buildings and sites. There will be prescribed time limit for the disposal of such appeals.

3.2 In the listing of buildings and sites the ASI would be functioning as the principal agent of the Union Government for preparing a comprehensive list of all ancient and historic buildings and sites throughout the country not only for purposes of taking action under the provisions of the Central Act for the preservation of archaeological monuments and sites but also for follow-up action to be taken by Development Authorities and municipal bodies in the concerned States. It will be obligatory on the ASI *under clear Government instructions* underpinned by law to furnish full details as soon as a building or a site has been listed to the concerned State Government, city Development Authority and municipal body for necessary follow-up action under the town planning and municipal laws. It is obvious that the ASI would have to function in very close co-ordination with the State Government and the local urban authorities while doing the work of survey, listing and gradation. In the case of important buildings and places the information should include detailed drawings prepared by a qualified architect and the team doing the work of survey and listing should normally include qualified professionals representing the disciplines of archaeology, town planning, architecture, civil engineering, municipal administration and land administration.

3.3 **State/UT Level.**—Though most of the States have an Act for the preservation of archaeological monuments and sites and also necessary development legislation for town planning and municipal administration, their Departments of Archaeology suffer by and large from organisational weakness and financial constraints and have a poor track record and it would be a folly to entrust them with the responsibility of carrying out extensive surveys for the listing and gradation of ancient and historic buildings and sites. Therefore the initiative would have to be taken at the district level by the District Collector who should be given the responsibility of preparing a time-bound programme for carrying out the survey for purposes of listing and gradation of the buildings and sites. The work of listing would have to be done by a team consisting of professional experts suggested for the national level. Wherever necessary the services of retired experts whose names have been included in an approved list may be utilised on payment of fees at pre-determined approved rates for serving on the team.

3.4 The State level work of listing will have to be district-based and in order that the work is completed in a time-bound manner, the Department of Archaeology (or the Department of Education and Culture, as the case may be) will have to take clear decisions in advance and place necessary funds at the disposal of the District Collector. The work will have to be done in close co-ordination between the State Department of Archaeology and its local officers at the district level and the concerned city Development Authority and municipal body. If the District Collector is kept fully in the picture it may not be very difficult to effect such co-ordination at the district level.

3.5 The guidelines to be followed by the district level teams will be laid down by the proposed statutory Urban Art Commission which will also be the appellate authority on the same lines as the statutory National Level

Commission of Built Environment. There will be a prescribed time limit within which the appeals would have to be disposed of.

4. It must be made clear that non-official organisation like the prestigious INTACH, the Calcutta Forum, the Save Bombay Group and other "amenity groups" may carry out surveys on their own and prepare lists of historic buildings and sites which, in their opinion, deserve to be brought under conservation. An instance of such non-official effort is the list prepared by the Bombay Chapter of INTACH and the excellent efforts made by the Bangalore Chapter. Studies may also be carried out by city Development Authorities with or without assistance from outside. A very good example is the study carried out by the Ford Foundation Project in Hyderabad which has already produced a Report and the study in progress in the city of Jaipur. Such efforts on the part of NGOs or Development Authorities will always be welcome and the recommendations made in the Reports can certainly be given due consideration by the ASI or the State Government but it will be their responsibility to scrutinise the recommendations and take appropriate decisions for the final listing and gradation of the buildings and sites.

5. In a few States (e.g. Goa) land use regulations and development controls are applicable to certain rural areas also. The Panchayat Act of one or two States provide for land use regulations in identified special areas. It is expected that in the few cases where a historic building or a site is situated outside the municipal area the application of the provisions of the Act for the protection of archaeological monuments, and sites will prove to be enough to ensure the conservation of the building/site. In the vast majority of the cases however the identified historic building or site would be in an urban area where the necessary town planning and municipal development controls would be available.

6. The organisation and revamping of the ASI to enable it to take up the work of listing and gradation of buildings and sites on a larger scale will take some time. The programme of work to be taken up thereafter will also take a minimum period. Meanwhile, the danger to the monuments and buildings will continue to exist and perhaps increase with increasing commercial greed for re-development particularly in the big cities. Therefore whatever can be achieved through the effective enforcement of the development controls under the existing town planning and municipal laws must be pushed through and the amendments of the town planning and municipal laws for preventing demolition and for serving "repair notices" carried out expeditiously. The State Governments may be exhorted to initiate action on these lines without waiting for the institutional changes.

7. As the survey and documentation under the Hyderabad Ford Foundation Project has caught the imagination of the town planners and architects and also of non-official bodies it will be an excellent idea to have such projects sanctioned in about a dozen States in the first instance as early as possible. Such a "package", has the advantage of not only giving a well-documented list of historic buildings and sites with full information after proper survey and in-depth examination but it also includes suggestions about legislative amendments and improvement in the co-ordinated functioning of the concerned Government organisations. Further it serves the very important purpose of creating public consciousness about the need for conservation and promotes discussions at various levels. I would recommend that such projects which can be carried out at comparatively moderate cost, should be taken up in about a dozen States in the country covering selected cities and other areas according to the needs of the situation. It would be appropriate for the Government of India to participate in the funding of such projects. The studies would yield ready material for the city Development Authorities and municipal bodies for incorporation in their development plans of the cities and the application of development controls, though the "protection" of the monuments/buildings under the Archaeological Act may have to wait formal listing by the prescribed authority.

CHAPTER VI

PERSONNEL

1. From what has been said in the foregoing Chapters it is clear that there are serious inadequacies in the personnel position either in numbers or in quality or in both, in the Government agencies concerned with the conservation effort. This is more glaring at the State/UT level both in the Government Departments and also in the Development Authorities and in municipal administration.

1.1 At the national level the premier institution is the ASI. The Mirdha Committee has made detailed recommendations about the strengthening of the ASI and I was told by the Director General of the ASI that action had been initiated on most of the recommendations. However these recommendations are based on the assumption of a certain workload for the ASI which does not include the additional responsibilities envisaged by me in making recommendations about survey and listing at the national level (Chapter V). When these responsibilities are assumed by the ASI the requirements of additional staff at different levels in the Conservation Wing will have to be worked out and action taken to put them in position.

1.2 In the States a detailed exercise should be made in respect of the staff employed by State Departments of Archaeology and other staff engaged in conservation work and also the output of the staff engaged by the different Development Authorities and the municipal bodies and on the basis of such an analysis a firm decision should be taken about allocation of work and strengthening of the staff where necessary. As mentioned in a foregoing Chapter many local bodies (municipalities) lack even the minimum technical staff in the discipline of engineering. These gaps must be filled for ensuring the enforcement of development controls and municipal bye-laws. Where necessary managerial subsidy may be given to the local bodies for the purpose.

2. Last but not the least is the need for training. The Government functionaries at all levels concerned with the work of urban conservation at any stage starting from survey and listing to repairs and maintenance must have a minimum knowledge of the subject and also orientation about the significance and importance of conservation. As noted by me in the foregoing Chapters all the Government Departments and other organizations enthusiastically supported the idea that the employees should be given in-service training through courses organised or sponsored by the ASI at different centres. The courses will be of different durations at different levels with appropriate course contents. The charges for the trainees would be willingly paid by the concerned Department or organization in the Government of India or in the State Governments. To begin with the ASI may prepare a detailed note spelling out the content of the training courses; coverage of employees of different disciplines at different levels; the duration of the courses; the location of the training centres and the cost of training. The note may be discussed between the DG, ASI and the Chief Planner, Town & Country Planning Organization of the Government of India and thereafter the requirements of the different Departments of the Government of India and the States and also of the Development Authorities and local bodies may be ascertained on a firm basis and the courses organised accordingly. The responsibility for organising the training and orientation courses will rest on the ASI and, if necessary, financial assistance may be given to the ASI for the purpose.

2.1 The availability of trained personnel whose services can be utilised for conservation work can be augmented by preparing a list of qualified people (including retired hands) in the private sector in the disciplines of archaeology, architecture, engineering, town planning and municipal administration and land administration. This has been dealt with under NGOs in Chapter III.

CHAPTER VII

PLANNING AND FINANCIAL ASPECTS

1. The analysis made in Chapters IV and V will indicate that barring the Plan and non-Plan provision made for the ASI at the Government of India level and the Archaeoloical Departments at the State level there is no other specific financial provision made for the conservation programme except for the grants-in-aid made by the Department of Culture to the INTACH and the expenditure incurred by the Urban Development Authorities or municipal bodies in the enforcement of development controls etc. which have a bearing on urban conservation.

1.1 Till such time as the non-official effort gathers momentum and the Conservation Fund is built up through donations and other contributions and levies like the Repair Cess in Bombay the Government agencies will have to play the major role in the funding of the conservation programme. In Chapter IV I made some suggestions regarding the expansion of the IDSMT scheme and the inclusion of conservation as an item which will be eligible for Central assistance to the States. The Ministry of Urban Development will have to do an exercise and formulate schemes for promoting urban conservation effort throuh Urban Development Authorities and municipal bodies. The schemes could either be in the nature of expansion of the existing high priority urban development schemes or entirely new schemes may be formulated in the Central Sector of the Plan. The other suggestions are:—

(i) A larger percentage of the Plan provision of the Department of Culture in the Government of India should be for urban conservation. This would not only include the additional funds which will be required by the ASI for strengthening its organisation and expanding its activities but also larger grants to selected institutions and NGOs and also assistance to the State Departments of Archaeology for well defined and time-bound projects. An important area where such assistance will be necessary and useful is in-service training.

(ii) The Union Ministry of Environment which has recognised that the problems of urban growth and resultant degradation of the urban environment are very much a part of the overall environmental picture, may take up a few more projects on the analogy of the projects taken up by the Central Ganga Authority. These may be principally in the area of pollution control and improvement in sanitation. The schemes may be drawn up in consultation with the Ministry of Urban Development and the pattern of assistance may be evolved in consultation with the concerned State Governments.

In drawing up such schemes a very important element would be the building up a cadre of trained staff in the municipal organisations to ensure continuity and proper maintenance of the assets that are created.

(iii) Considerable amount of funds both from budgetary and institutional sources (HUDCO etc.) flow every year for financing housing projects in the public sector implemented by State Housing Boards, Development Authorities, Improvement Trusts, Public Sector Companies, Corporations etc. The quantum is expected to increase considerably with the setting up of the proposed apex housing finance body at the national level and regional bodies in participation with commercial Banks. The proper location of housing colonies in conformity with a land use plan is vital for built environment and it will be very much in the interest of urban conservation to impose a condition that the financing body should satisfy itself in consultation with the concerned Urban Conservation Authority that there is a proper land use plan for the urban area where the housing colony is to come up and the location will be in keeping with the requirements of urban conservation. The guidelines for this may be drawn up by the Ministry of Urban Development which may also monitor the implementation of directions.

CHAPTER VIII

INCENTIVES

1. In a sense urban conservation effort has always to be "participative" and such participation by the Urban Conservation Authority, property owners, enlightened citizens, the Archaeological Department and Research Institutes etc. is based on the assumption that there is a minimum level of consciousness. At the same time certain norms of equity and justice have also to be kept in mind if public resentment is to be avoided. The idea that some form of financial assistance or compensation should be given to the affected property owners on account of the enforcement of development regulations, flows from the concept of equity and justice. Indirectly incentives can be given to property owners to persuade them to preserve the historic monuments and sites and not demolish such buildings for re-development of the property for commercial gain.

1.1 The options before the Urban Conservation Authority are:—

(a) compulsory acquisition;

(b) decontrol of rent;

(c) taxation relief; and

(d) grants and loans.

The first option is the best for purposes of preservation of the buildings in the fullest sense but acquisition will be costly in most cases and financial constraints will not permit a large number of buildings to be acquired. Besides, this may not be the most appropriate formula for universal application in a large number of cases the best solution would be to encourage the owners themselves to conserve and re-use their buildings.

1.2 By way of financial inducements imaginative changes in the Rent Control Act may be made to get the best mileage in favour of urban conservation without compromising the basic objectives of rent control.

1.3 For purposes of tax relief the relevant taxes would be property tax, gift tax, wealth tax, vacant land tax and income tax. With the low incidence of tax and with decreasing value of the listed properties mere exemption from property tax may not be very effective but tax incentives may be attempted if the quantum of tax exemption is not less than the estimated expenditure on the maintenance and repairs of the listed buildings owned privately. Income tax is a powerful instrument and it can be used effectively by adopting a system of graded exemptions, the higher level of exemptions being given for cash donation to various Conservation Funds identified by Government for the purpose. Tax exemption under gift tax and wealth tax may also be granted to owners of listed properties. The State Government may consider exemption on transfer fees levied on listed properties if they are sold or gifted out. Business houses or private charitable trusts adapting well defined projects for the restoration and maintenance of historic buildings, sites and gardens, fully respecting the "public amenity" aspect, may be considered for suitable exemptions in income tax, subject to the projects being approved by the nodal agency for conservation which will also have the right of inspection and monitoring.

1.4 There are a whole host of other possibilities for granting graded exemption in income tax and in the case of historic buildings which are put to adaptive re-use—whether residential or non-residential—even for commercial gain, subject to the overall condition that repair and maintenance are carried out according to prescribed standards. All such projects would be subject to inspection and monitoring by the Urban Conservation Authority.

1.5 In all cases professional and constructional services must be made available to all types of listed properties whether owned by private, Government or semi-Government agencies.

1.6 The Urban Conservation Authority should evolve a code of grants and loans for the different categories of their recipients. As a promotional measure financial institutions like commercial banks may evolve a scheme for advancing loans to individuals or private institutions for the restoration or repair of historic buildings.

1.7 In the enforcement of development controls the scheme of "transferable FAR" may be adopted to compensate those hurt by conservation measures. This would be a special dispensation permitting transfer of development rights.

1.8 Secondly, in drawing up the zonal plans for urban conservation the idea of non-incentive FAR may be kept in mind. In effect this would mean that the FAR in the zone in which the listed building is situated will be kept not appreciably higher than the old FAR so that the property owner may not have much incentive to demolish the old structure and construct a high-rise building (if a higher FAR were permitted). He will also have no sense of deprivation if the FAR continues to be more or less at the old level.

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STATEMENT SHOWING THE ACTUAL INCOME AS WELL AS EXPENDITURE ON ESTABLISHMENT OF THE URBAN LOCAL BODIES FOR THE LAST FIVE YEARS

(HIMACHAL PRADESH)

ENCLOSURE A

Sl. No.	Name of Committee	Year	Actual Income Excluding grant-in-aid	Actual Ext. on Establish-ment
1	2	3	4	5
1.	M.C. Theog	1981–82	3,22,706·86	2,15,897·47
		1982–83	1,05,881·22	1,91,351·17
		1983–84	93,301.54	1,74,011·68
		1984–85	1,10,679·56	2,16,508·91
		1985–86	96,660·75	1,93,210·58
2.	M.C. Sri Naima Devi ji	1981–82	2,45,342·28	1,04,436·94
		1982–83	2,58,226·90	1,12,402·91
		1983–84	3,25,872·90	1,14,945·90
		1984-85	4,12,482·45	1,15,765·45
		1985-86	2,91,651·61	1,36,842·65
3.	N.A.C. Bujan-par	1981–82	15,707·20	7,770·00
		1982–83	16,667·40	3,800·00
		1983–84	23,384·40	12,775·55
		1984–85	23,985·00	9,877·75
		1985–86	54,782·00	24,120·00
4.	M.C. Dharam-shala	1981–82	13·92,271,53	7,61,319·41
		1982–83	12,09,965·62	7,45,824·95
		1983–84	12,41,605·66	7,23,368·80
		1984–85	12,78,680·72	8,52,407·42
		1985–86	14,74,478·60	7,85,314·72
5.	M.C. Sunder-nagar	1981–82	10,66,247·85	7,98,913·20
		1982–83	10,76,430·73	7,49,926·35
		1983-84	15,62,751·92	8,66,531·20
		1984–85	15,36,162·62	7,76,911·35
		1985–86	15,55,651·10	9,72,438·05
6.	M.C. Bilaspur	1981–82	9,15,111·50	4,44,190·77
		1982–83	1,48,518.70	4,09,498·12
		1983–84	2,90,951·85	4,19,199·17
		1984–85	2,12,349·10	4,82,115·80
		1985–86	1,19,742·40	4,93,522·47
7.	N.A.C. Bhun-tar.	1981–82	2,35,550·00	1,67,301·00
		1982-83	84,996·00	1,22,164·00
		1983–84	1,02,385·00	88,677·00
		1984–85	76,921·00	93,560·00
		1985–86	1,08,596·00	1,37,380·00
8.	M.C. Hamir-pur	1981-82	5,47,939·67	4,07,896·95
		1982–83	3,69,877·47	3,57,118·94
		1983–84	5,09,715·77	2,71,293·15
		1984–85	5,33,261·00	3,12,165·00
		1985–86	5,50,004·00	3,52,468·00
9.	N.A.C.Manali	1981–82	8,33,496·00	2,92,297·00
		1982-83	7,78,888·00	3,19,262·00
		1983–84	10,32,799·00	2,66,408·00
		1984–85	11,64,041·00	3,10,156·00
		1985–86	8,47,261·00	3,05,295·00
10.	N.A.C. Ghu-Marwin	1981–82	14,231·80	8,084·50
		1982–83	26,795·69	9,934·00
		1983–84	29,184·43	12,144·00
		1984–85	34,649·05	14,536·00
		1985–86	58,616·00	21,334·00
11.	M.C. Nurpur	1981–82	2,22,487·00	2,24,710·00
		1982–83	1,13,846·00	2,16,435·00
		1983–84	96,798·00	2,61,206·00
		1984–85	1,14,996·00	2,14,783·00
		1985–86	1,06,569·00	2,34,721·00
12.	M.C. Dal-housie	1981–82	5,61,756·00	3,96,384·00
		1982–83	4,76,767·00	4,93,582·00
		1983–84	4,69,165·00	4,33,367·00
		1984–85	6,44,341·00	4,60,588·00
		1985–86	5,60,149·00	5,65,652·00
13.	M.C. Kangra	1981–82	6,86,069·00	2,76,574·00
		1982–83	5,08,008·00	2,42,929·00
		1983–84	5,91,511 00	1,43,179·00
		1984–85	5,46,895.00	1,34,702·00
		1985–86	6,63,430·00	1,55,8300·00
14.	N.A.C. Dehra	1981–82	40,308·18	44,912.82
		1982 83	65,285·77	66,293·14
		1983–84	75,774·75	66,523.70
		1984–85	1,16,325·85	70,231·85
		1985–86	1,10,274·40	1,13,527·25

1	2	3	4	5
15.	N.A.C. Mehatpur	1981–82	5,000·00	2,100·00
		1982–83	11,000·00	2,100·00
		1983-84	9,900·00	2,100·00
		1984–85	18,900·00	2,100·00
		1985–86	17,255·00	2,240·80
16.	N.A.C. Santokhgarh	1981-82	29,667·05	22,150·00
		1982-83	9,299·80	14,976·80
		1983–84	24,947·10	12,617·90
		1984–85	24,407·25	20,748·00
		1985–86	27,290·40	21,700 00
17.	M.C. Paonta	1981–82	5,51,371·00	4,35,160·00
		1982–83	2,36,398·00	3,30,188·00
		1983–84	3,45,785·00	3,24,499·00
		1984–85	3,40,923·00	3,44,017·00
		1985–86	3,94,885·00	4,21,597·00
18.	M.C. Nahan .	1981–82	18,19,944·13	13,88,358·00
		1982–83	7,34,426·00	12,48,158·00
		1983–84	2,27,604·00	11,43,743·00
		1984–85	4,04,334·00	12,07,453·00
		1985–86	3,73,245·00	13,29,364·00
19.	N.A.C. Sarahan	1981–82	5,580·00	5,580·00
		1982–83	5,580·00	5,580·00
		1983–84	5,832·00	5,832·00
		1984–85	5,832·30	5,832·30
		1985–86	6,287·30	6,287·30
20.	N.A.C. Sarkaghat	1981–82	..	..
		1982–83	5,988·00	5,231·05
		1983–84	6,087 00	6,898·80
		1984–85	25,545·00	19,677·35
		1985–86	32,8·001	29,404·25

1	2	3	4	5
21.	N.A. C. Dhalli	1981–82	4,05,420·41	2,25,318·70
		1982–83	3,55,080·04	1,61,695·18
		1983–84	4,13,713·18	1,77,447·20
		1984–85	3,97,497·98	2,14,785·87
		1985–86	4,42,414·22	1,97,955·84
22.	N.N.C. Jawalamukhi	1981–82	98,013·35	76,553·25
		1982–83	1,22,860·61	71,754·52
		1983–84	1,56,368.80	78,552.08
		1984–85	2,32,247.93	1,34,488·97
		1985–86	3,89,923.20	1,52,039·55
23.	M.C.Rampur	1981–82	4,87,229·39	3,47,375·30
		1982–83	4,74,272·39	3,34,539·75
		1983–84	5,04,943·21	3,30,621·61
		1984–85	5,93,494·82	3,15,359·30
		1985–86	6,99,356·64	3,82,770·10
24.	M.C. Palampur	1981-82	4,55,789·00	2,94,424·00
		1982–83	2,41,206·00	2,10,757·00
		1983–84	2,83,962·00	2,18,813·00
		1984–85	2,47,707·00	2,61,870·00
		1985–86	2,64,127·00	2,84,896·00
25.	N.A.C. Nagrota	1981–82	2,21,391·00	91,909·00
		1982–83	1,22,208·00	66,988·00
		1983–84	1,51,043·00	66,551·00
		1984–85	2,24,644·00	65,475·00
		1985–86	2,13,999·00	1,26,743·00
			Lacs	Lacs
26.	M.Corp.Shimla	1981–82	113·63	92·39
		1982–83	145·08	103·11
		1983–84	157·59	107·87
		1984–85	152·26	118·19
		1985–86	171·29	125·00
		1986–87	225·99	137·00
27.	N.A.C. Daulatpur	1981–82	..	..
		1982–83	6,000·00	..
		1983–84	12,167·17	6,910·00
		1984–85	19,944·21	11,569·60
		1985–86	28,934·37	12,503·15

ENCLOSURE 'B'

EXTRACTS FROM MUNCIPAL COUNCIL, JAIPUR (BUILDING BYELAWS 1970)

12. **Protection in wall city area Land.**—(a) Todas, Balconies, Jharokas, Varandahs and other projections excluding chajja shall not be allowed or permitted where the distance between the exterior of the proposed projection and centre of the street is less than 4 meters.

Explanation.—Measuring the width of such street, it shall be taken from the extreme face of the building or part thereof of nearest to the road on the side of proposed construction to the corresponding face of the building or part thereof as the case may be on the opposite side, including the projection like varandahs, chabutras or platforms on both the sides of the opposite buildings.

(b) The width of such todas, balconies and such other projections shall not be more than 1-1/4 meters.

(c) The proposed projection shall not project beyond the existing Saran or such projection in the same building or other adjoining building in the vicinity.

(d) Chajjas upto maximum width of 45 cms. may be permitted in a street which is more than 4 meters wide and streets which are between 3 meters to 4 meters in width, chajjas to a maximum width of 30 cms. may be allowed, but no chajja shall be allowed in a street which is less than 3 meters in width.

(e) No Ikdhalia, verandah, taj. khurra, platform, chabutra, steps or pusties and similar construction be allowed in or upon any street where the width of such street might be reduced to less than three meters by such construction.

(g) Verandahs allowed whether or not constructed at the cost of the owner of the house or shop shall not be partitioned off or provided with any kind of shutters either in the front or on sides.

(h) Cantilivered car porches may be permitted at a hight not more than 2.50 meters from the plinth level. Such projection shall be limited to 2.50 meters width if provided in sides, where such set backs are not less than 3.35 meters and the area of all such porches in a plot should be more than 10.8 sq. meters, subject to the approval of the Urban Improvement Trust in the scheme area.

(16) **Restriction regarding use of Building.**—No building shall be used for a purpose other than for which it has originally been declared in the notice. However, in exceptional cases, the Council may permit the change of the use of land provided such change is not in contravention of land use prescribed in the master plan.

26. Prohibition regarding alterations in the structural design colour, etc. of the building:—

(1) No alteration in the structural design, appearance, colour and other architectural features, including kangooras, panels, pillars, shutters, railings parapet walls, balconies and jharokas and other structural fittings shall be carried out by any owners or occupier to the elevation of any building facing the main bazar of the city or any portion of such building as may be visible from the said bazars against the uniformity and such contrast to the general design, colour, scheme and architectural features of the locality and as prescribed herein.

(2) For the purpose of this bye-law the following shall be generally structural design, colour scheme and architectural features of the buildings in the main bazars of the city:

(a) In the Sireh Deorhi Bazar, Johri Bazar, Tripolia Bazar, Ramganj Bazar, Kishanpole Bazar, Moti-Katla, Gangori Bazar, Surajpole Bazar and Ghat gate Bazar (i) colour of walls of buildings including verandahs and their pillars shall be dark pink.

(ii) colour of shutter, doors and windows shall be pink or brown wood colour.

(iii) Colour railings, window grills stencilling and decorations shall be white;

(iv) verandah in front of a shop shall remain open in the front and side so as to form an open corridor throughout the length of the Bazar and the opening shall be rectangular with flat lintel with a name plate and Kangooras as per approved design.

(b) In Chaura Rasta (i) colour of walls including verandahs and their pillars shutters of doors and railings, window grills strencilling and decorations shall be prescribed in sub clause (a) as in other bazars while verandahs in front of shops shall have an arched opening as per approved design.

(c) **In Babu Bazar and Nehru Bazar.**—Openings of the verandahs shall be rectangular with parapets on Chajjas as per approved design and colour of walls be as given in sub-clause (a);

(d) **In Mirza Ismail Road**—Colour of the buildings shall be pink or cream or stone colour.

(e) In Agra Road from (Ajmeri gate to Ghat gate) colour of the buildings shall be pink.

(f) In Amer Road (from Subhash Chowk to Jal Mahal) –colour of the buildings shall be pink.

(3) For the areas referred to above and special areas as may be notified from time to time by the Government, the building plans will be referred to the Chief Town Planner, Rajasthan for his advice before their approval.

(4) Approved designs of elevations in respect of the aforesaid main bazars shall be available for inspection in Municipal office.

(5) Where the elevation of a building or portion thereof facing towards or visible from any of the aforesaid bazar is not in conformity with the approved structural design or structural features as prescribed in this bye-law the council may call upon the owner or occupier by a written notice of not less than 30 days to make the same in such conformity.

(6) No erection, alteration or re-erection of any elevation to a building facing towards or risable from any of the aforesaid bazars shall be permitted which may not be in general harmony and conformity with the prescribed structural design and architectural features of the locality.

31. **Prohibition for construction under city walls.**—Except by special permission of the Council which shall be given on the advise of the Chief Town Planner, Rajasthan, Jaipur no new pucca or kutcha building shall be allowed to be constructed within 5 meters of the city walls.

ENCLOSURE 'C'

LEASE DEED

THIS LEASE DEED is made on this the 19th day of July, one thousand nine hundred eighty six, between Thakurji Govind Devji Trust, through its Shebait and Manager Goswami Pradumna Kumar Dev, hereinafter called the 'LESSOR', which expression shall, where the context shall admit, include its successors assigns, Shebaits in office of the One part; AND The Hundustant Charity Trust, leaving its principal office at Calcutta, through its *Power Attorney holder* Shri M.L. Saboo son of Shri Hari Ram Saboo, residing at Plot No. *14*, Mahavir Marg; 'C' Scheme, Jaipur, hereinafter called the 'LESSOR' which expression shall, where the context shall admit, include its successors. assigns, administrators, etc. of the other Part.

WHEREAS, the Lessor owns and possesses a big area of land, out of which land admeasuring 75625 Sq. Yds. comprised in Khasra nos. 6480, 6481, 6482, 6483, 6485, 6492, 6493, 6401 to 6437 admeasuring 75625 Sq. Yds at Amber Ghati on the Eastern side of the road from Jaipur City to Amber in which two temples, a garden, a Bewari enclosed by a compound Wall belonging to the Lessor exists, which is more particularly described in the Schedule hereunder written and for greater clarity delineated in Red colour in the plan annexed hereto. This plan is according to the revenue records, which shall form part of this deed. All this land & constructed buildings are the absolute properties of the Lessor and the Lessor is fully empowered to transfer the said land and buildings to any person or persons; AND

WHEREAS the Lessor is desirous of establishing a 'Vedanta Centre' in close proximity of the above temples and with this area in view, approach Goswami Pradumna Kumar Dev to set-out the above said Land, garden and the Baori for establishing a Vedanta Centre; AND

WHEREAS the Lessor is equally keen to allow the Lessee to establish a Vedanta Centre in the close proximity of the two temples.

NOW THEREFORE, THIS INDENTURE WITNESSETH AS FOLLOWS :—

(A) That in consideration of payment of Rs. 12,000 (Rupees Twelve thousand only) per year as yearly rent payable by the Lessee to the Lessor by 31st March every year and further in consideration of the undertaking given by the Lessee for the renovation in the temples and improvement in the garden at its own costs, the Lessor hereby conveys by way of lease for a period of 99 years commencing from 1st day of August, 1966 all that land mentioned in the Schedule given hereunder unto the said lessee and to hold the same along with all rights of easement of cess; light and air, trees etc. on a rent of Rs. 12,000 per annum on the terms and conditions hereunder mentioned.

1. That the Lessee shall regularly pay in advance annual rent amounting to Rs. 12,000 per annum to the Lessor on or before 31st March every year. Rent upto 31st March, 1987 has already been paid.

2. That the lease amount shall be increased after every ten years by 10 per cent over and above the lease amount.

3. That the Lessee shall be entitled to make such constructions for using the land for the aforesaid purpose at such place or places which do not in any way or in any manner mar the sanctity and spoil the secrenity of the locality.

4. That the Lessee shall not use the area for any commercial purpose whatsoever and it will be primarily used for religious discourses, teachings, conferences, discussions, pravachanas, research, library, dharamshala, rest house and residential apartments for teachers and students for carrying on such activities and other purposes of general public utility. All permanent constructions shall be done by the Lessee with the concurrence of the Lessor, which concurrence shall not be reasonably refused.

5. That the Lessor authorises the Lessee to the 'baradari' or the open roof of the temple although not included in the demised premises for discussions pravachanas, lectures, discourses, etc. If at any time the Lessor feels that the Lessee or its agents, servants etc. have started the use of the above apartments contrary to the latter and spirit of this indenture, the Lessor can stop the use of the apartments for any purpose whatsoever by the Lessee.

6. That the Lessee shall have a right but not be obliged to make necessary arrangements for eviction of the occupants of various rooms below the temple and the open land at its own costs and expenses.

7. That the Lessee shall repair and renovate the temple at its own costs without any reimbursement thereof from the Lessor and after repairs and renovations are done the temples will be handed over back to the Lessor and the temples shall remain under the control and management of the Lessor.

8. That the Lessor may, in its discretion and desire, allow the room on the ground floor for the temporary residence of Sadhus, Sanyasis and pilgrims, but in no case the Sadhus, Sanyasis and the pilgrims etc. will be permitted to use the same for permanent residence. The Lessor may also allow some of the ground floor room for the residence of scholars to come and stay for the studies of Shrimat Bhagwat, Vedas, Upnishad, Geeta, Ramayan, etc. and other religious purposes.

9. That the main purpose of the Lessee taking this land and premises on lease is to promote and establish and institution for studies of Shrimat Bhagwat, Veda, Upnishad, Geeta, Ramayana, etc. and so the various apartments in the two temples may be used for that purpose with the concurrence of the Lessor or his successors but in case Lessor does not concur in such use of any of these apartments the Lessee shall not insist or the use of the same.

10. That all expenses relating to the resilence, mess, etc. of the scholars and students shall be borne by the Lessee.

11. That the southern part of the land of the Lessor in Khasra Nos. 6492 and 6493 is presently submerged in Jal Mahal water. It is included in the demised land.

12. That the actual physical possession of the entire demised land has been handed over by the Lessor to the Lessee excepting the garden enclosed by a compound wall, for which the lessor shall take all necessary steps at the earliest possible for evicting the occupants and handing over the said garden to the Lessee.

13. That the electricity and water charges and house tax including that of the temples if levied at any time, shall be paid by the Lessee.

14. That as Thakurji Govind Devji Trust is a duly registered Trust under the Rajasthan Public Trusts Act, 1959, Goswami Pradumna Kumar Dev has sought permission to Government of Rajasthan to lease the above land to the Lessee for a period of 99 years vide letter of Deputy Secretary to the Government of Rajasthan, bearing No. F. 11(15)Rev/3/84, dated 3rd August, 1985.

15. That the details of Khasra Nos. as shown in the Schedules are according to the revenue records. The enclosed site plan shall form part of this Lease Deed.

16. That all expenses relating to this deed for stamp duty, registration etc. are being borne by the Lessee.

SCHEDULE

KHASRA Nos. :—6480, 6481, 6482, 6484, 6485, 6492, 6493 and 6504 to 6537.

IN WITNESS WHEREOF both the parties to this Deed of Lease have set and subscribed their respective hands and seal to this deed on the day, month and year written hereinabove.

Sd/-
LESSOR
Lessee :— Sd/-

WITNESSES :— Sd/-

सत्यमेव जयते

ENCLOSURE 'D'

PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA

Subject :—Reservation of ancient monuments in Bijapur—Prohibition of construction of buildings in the vicinity thereof.

Preamble :

There are some ancient monuments which are of historical and national importance in Bijapur. The Archaeological Department of the Government of India have taken action to preserve these monuments. Not only the preservation of these monuments, but the preservation of the environments of these monuments in an aesthetic condition is quite essential. It has come to the notice of Government recently that construction of buildings of more than one storey have been permitted within the vicinity of these national monuments. Construction of such buildings within the environs of the monuments mar the beauty of the monuments. It is considered necessary that the construction of buildings within the vicinity of these monuments should be controlled and regulated.

Order No. HUD 128 TTP 79 Dated, Bangalore, the 12 June, 1980.

After careful examination of the matter, Government, under the proviso to sub-section (1) of section 15 of the Karnataka Town and Country Planning Act, 1961 (Karnataka Act 11 of 1963), direct as follows :—

(a) No commencement certificates should be issued by the Planning Authority or other Authority for construction of buildings within a radius of 100 meters from the premises of Gol Gumbuz and Ibrahim Roza and within a radius of 50 meters from the premises of Jami Masjid, Malik-e-Muidam, Uppali Burz. Bardkanam, Assar Mahal, Gagan Mahal, and Jod Gumbuz unless clearance for such construction is given by the Director of Town Planning, Bangalore.

(b) The Director of Town Planning should consult the Department of Archaeology, Government of India, before according the clearance for issue of commencement certificate and that the opinion of the Director of Town Planning should be communicated to the Planning Authority sufficiently before the expiry of the three months period mentioned in section 15(1) of the oversaid Act.

By order and in the name of the Governor of Karnataka.

Sd/-

(V. SUSHEELA DEVI)

Under Secretary to Government,

Housing & Urban Development Department.

COPY

GOVERNMENT OF KARNATAKA

No. HUD 168 TTP 79

Karnataka Government Secretariat, Mini Tower, Visvaswaraya Centre, Bangalore, dated 30th June 1988.

NOTIFICATION

In exercise of the powers conferred by Sub-Section (1) of section 189 of the Karantaka Municipalities Act, 1964 (Karnataka Act No. 23 of 1964), the Government of Karnataka hereby prohibit with effect from 1-7-1982 erection of any building in Badami town and surroundings, the running boundary of which is indicated in the schedule annexed, except with the permission granted by the Government in this behalf.

By Order and in the name of the Governor of Karnataka.

Sd/-

(ABDUL BASHEER),

Under Secretary to Government,

Housing & Urban Dev. Deptt.

COPY

GOVERNMENT OF KARNATAKA

No. RDC 123 MIS 82(1)

Karnataka Government Secretariat, IIIrd Stage, Multistoreyed Bldg., Bangalore, dated 12th September 1983.

NOTIFICATION

In exercise of the powers conferred by Sub-section (1) of section 54 of the Karnataka Village Panchayats and Local Boards Act, 1959 of (Karnataka Act No. 10 of 1959), the Government of Karnataka hereby prohibit with effect from 12-9-1983 erection of any building in PATTADAKAL Village and surroundings the running boundary of which is indicated in the Schedule annexed, except with the permission granted by the Government or any Officer authorised by the Government in this behalf.

SCHEDULE

Description of the running boundary of Control Area for Pattadakal (Proposed to be) declared under Section 54 of Karnataka Village Panchayats and Local Boards Act, 1959.

The boundary line commences on Bachingudd Road at the South-west corner of S. No. 148 of Pattadakal and runs northwards to touch the cart-track. From-here, it runs south-east along the northern boundary of S. No. 148 (Southern side of cart-track) to touch the North-east corner of the same S. No. From here the line crosses the cart-track and touches the South-west corner of S. No. 13 and runs eastwards on the northern boundary S. No. 13 to touch the cart-track from Akragal. After crossing the cart-track the line runs further east along the northern boundary of S. No. 10 to touch the left bank of Malaprabha River at the North-east corner of S. No. 10. From here, the line runs southwards along the left bank of the river (upstream) on the eastern boundary of S. Nos. 10, 9, 2, 1A, Village Site, 167, 166, and then along the southern boundary of S. Nos. 165, 164, 163, 162, 160, 159, 158, 154 and 150 of Pattadakal.

The line then runs northwards along the western boundary of S. No. 160 to touch the South-east corner of S. No. 145. Then the line runs along the southern and western boundaries of S. No. 145 to cross the road

from Bachingudd. After crossing the road the line joins the south-west corner of S. No. 148 of Pattadakal, the point from where the line commenced.

by Order and in the name of the

Governor of Karnataka,

Sd/-

Under Secretary to Government,

Rural Devt. & Copn. Department.

GOVERNMENT OF KARNATAKA

No. RDC 123 MIS 83(ii)

Karnataka Government Secretariat,

IIIrd Stage, Multistoreyed Bldg.,

Bangalore, dated 12th September 1983.

NOTIFICATION

In exercise of the powers conferred by Sub-section (1) of Section 54 of the Karnataka Village Panchayat & Local Boards Act, 1959 (Karnataka Act No. 10 of 1959), the Government of Karnataka hereby prohibit with effect from the date of issue of Notification erection of any building in AIHOLE Village, Hungund Taluka and surroundings the running boundary of which is indicated in the Schedule annexed, except with the permission granted by the Government or any Officer authorised by the Government in this behalf.

SCHEDULE

Description of the running boundary of the Control Area (proposed to be) declared for Aihole under Section 54 of Karnataka Village Panchayats and Local Boards Act, 1959.

The boundary line of the Control Area commences at the Western extreme point of S. No. 59 of Aihole on the road from Kalligidd. The line runs eastwards along the northern boundary of S. No. 59 to cross another track from Kalligudd and run on the northern boundary of S. No. 82, 83, 84 to touch the north-eastern of S. No. 84. Then the line turns south-wards and runs on the eastern boundary of S. No. 84 and touch the road to Sulabhavi. Then the line runs eastwards on the northern boundary of the road to touch the eastern boundary of S. No. 85. Then the line turns south, crosses the road to Sulebhavi and runs along the eastern boundaries of S. Nos. 85, 78, 77 and 236 to touch the South-east corner of S. No. 236 on the village boundary. From here the line runs along the eastern boundary of Aihole Village i.e., S. No. 236, 242, 255, 256, 257, 259, 260 to touch the South-east corner of S. No. 260 of Aihole. From here the line runs westwards along the southern boundary of S. Nos. 260 & 261 to cross the road and join the north-eastern corner of S. No. 60 of Chilapura. Then the line runs on the eastern and southern boundary of S. Nos. 60 and 59 to touch the cart track. Then the line runs south-east on the northern boundary of the cart track (western boundary of S. No. 55) to touch the South-western corner of S. No. 55. From here the line runs to touch the eastern most point of S. No. 267 of Aihole. Then the line runs southwards cutting across S. No. 24 of Benakanawari to join the eastern extremity of S. No. 23 of the same village. The line from the eastern extremity of S. No. 23 of Banakawari runs westwards along the southern boundary of S. Nos. 23 and 22 of Benakanawari to cross Malaprabha river and join the eastern boundary of S. No. 15 of Sabalahunishi on the left bank of Malaprabha river. Then the line runs northwards along the eastern boundary of S. Nos. 15 and 14 (left bank of Malaprabha river) to touch the southeast corner of S. No. 13 of Sabalahunishi. From here the line runs westwards along the southern boundary of S. Nos. 13 and 9 to touch the southwest corner of S. No. 9.

From the southwest corner of S. No. 9 the line runs northwest along the western boundary of S. No. 9 (Village boundary) of Sabalahunishi to cross Malaprabha river and touch the southwest corner of S. No. 279 of Aihole. Then the line runs further westwards along the southern boundary of S. No. 10 of Kalligudd (right bank of Malaprabha river) western boundary of S. Nos. 10, 9. 8 to touch the north-west corner of S. No. 8 of Kalligudd.

From the north-west corner of S. No. 8 of Kalligudd the line runs eastwards along the northern boundary of S. No. 8 (Southern boundary of road to Aihole). Then the line turns north, cross the road and touches the south-west corner of S. No. 11 of Aihole. Then it runs on the western and northern boundaries of S. No. 11 to cross the nala and to run on the northern boundary of S. Nos. 10, 285, 3 of Aihole to cross the road from Kalligudd and join the western extreme point of S. No. 59 of Aihole, the point from where it commenced.

By Order and in the name of the Governor of Karnataka,

Sd./-

Under Secretary to Government,

Rural Devt. & Coopn. Department.

To,

The Compilar, Karnataka Gazette, Bangalore for publication in the ensuing Gazette.

Copy to :

1. The Director of Town Planning, Bangalore.
2. The Secretary to Government, Home Department.
3. The Chairman & Managing Director, Karnataka State Tourism Development Corporation Ltd., Bangalore.
4. The Director General of Tourism and Ex-officio Additional Secretary, Ministry of Tourism and Civil Aviation, Government of India, New Delhi.
5. The Divisional Commissioner, Belgaum.
6. The Deputy Commissioner, Bijapur.
7. The Secretary P.A. for Bijapur.
8. The Chief Officer, Taluk Development Board, Hungud Taluk.
9. Weekly Gazette.
10. Section Guard File.

SCHEDULE

Description of running boundary of the control area under Section 180 of the Karnataka Municipalities Act, 1964 for Badami.

The running boundary of the Control Area commences from south-eastern corner of the R. S. No. 523 on Kabalageri-Budami Road and runs along the southern boundary of R. S. Nos. 524, 520 crosses the Bagalkot-Badami Road and runs along the southern boundary of R. S. Nos. 531, 2 and along the eastern boundary of R. S. No. 1 and turns towards north and runs along the western boundary of R. S. No. 536 turns east and runs along the northern boundary of R. S. Nos. 530 and 504 runs towards south and runs along the eastern boundaries of R. S. No. 104, south eastern boundary of R. S. No. 536, eastern boundary of R. S. No. 107 to cross the cart-track. After crossing the cart-track, it runs southwards along the eastern boundary of R. S. Nos. 111 and 108 and touches south-east corner of R. S. No. 108. From here the

boundary cuts across R. S. No. 111 and touches the north-east corner of R. S. No. 109 turns towards east and runs along the northern boundary of R. S. No. 538A then turns towards south and runs along the eastern boundary of 538A to touch the south-eastern corner of S. No. 538A. From the south-east corner of S. No. 538A the line turns west and runs on the southern boundary of S. Nos. 538A, 114, 121A to touch the south-west corner of S. No. 121A of Badami. Then the line crosses the road to Ron, touch the eastern boundary of S. No. 119 of Badami. Then the line runs further west along the southern boundary of S. No. 119, cross the road to Shivapuri runs on the southern boundary of S. No. 131 crosses another track runs on southern boundary of S. Nos. 167, 173 to touch the south-west corner of S. No. 173. Then the line crosses the track and runs on the southern boundary of S. Nos. 183, 182 turns northwards and runs on the western boundary of S. Nos. 183, 182 turn to touch the road from Yara oppa. The line crosses the road to touch the southeast corner of S. No. 186 of Badami and runs south-west along the southern boundaries of S. Nos. 186 and 187 (northern boundary of the road) to touch the southern extreme point of S. No. 187 of Badami.

From the southern extreme point of S. No. 187 the line turns northwards and runs along the south-western boundary of R. S. Nos. 187 and 190 and touches the western extreme point of S. No. 190. From here the boundary runs further north and runs along the western boundaries of R. S. Nos. 190, 191A and 198 crosses Badami-Vardain road and runs along the western boundaries of R. S. No. 200 and crosses a field track. The boundary runs from here towards north along the western boundaries of R. S. Nos. 207, 208, 309 and 310 and touches the road. After crossing the road, it turns west and runs along the road until it meets the south-west corner of R. S. No. 883 and runs along the western boundary of R. S. No. 218 and crosses and the field track. After crossing the field track, the boundary line runs north-east along the eastern boundary of S. Nos. 531, 523 to cross Kabalagori-Badami Road and touch the starting point, at the south-eastern corner of S. No. 533.

Sd./-
(ABDUL BASHEER)
Under Secretary to Government,
Housing & Urban Dev. Deptt.

ENCLOSURE 'E'

THE DRAFT BILL ON URBAN CONSERVATION

The salient features of the draft Bill are stated below :—

Listed Buildings :

1. The Urban Development Authority, after conducting a survey and after consulting an expert committee shall prepare a list of buildings of historical, architectural or social importance which need protection. The draft lays down certain criteria for selecting the buildings. The buildings are to be listed in two categories depending on their relative importance viz., 'listed local monuments' and 'listed historical buildings'.
2. The Authority shall give public notice of the intention to notify the buildings and the objections and suggestions received shall be examined by an expert committee. The list alongwith the committee's recommendations shall be sent to the Government for their approval.
3. After approval of the Government the list will again be published in local newspapers for public information. At this stage the owners of the buildings will be individually informed. Deletion from the list will require going through the entire exercise all over again. This is to avoid any arbitrariness in the process.
4. If any archaeologically protected monuments are de-protected by the concerned departments, such monuments shall automatically get the status of 'listed buildings'.
5. The owners of the listed buildings cannot demolish the buildings or make alterations in the buildings without prior permission of the Authority. They must apply for 'listed building consent' to the Authority which the Authority may either grant or refuse. In the case of demolition and major new additions or alterations, the applicant must give one month's notice to the A.P. Urban Art Commission (this does not exist anymore) and the Department of Archaeology who may express their views, if any, within that period. The application to the Authority for such a case shall be accompanied with the views if any of these two Departments. After that the Authority must issue one month's notice in the newspapers for public information calling for objections and suggestions. Any applicant not complying with these provisions commits an offence which is punishable by fine or imprisonment.
6. Causing damage to a listed building is punishable with fine or imprisonment.
7. In case there is a building of importance which is not listed and is likely to be pulled down or damaged, the Authority may issue a "building preservation notice" which gives the building the status of a 'listed building' for a period of six months. This is something like an ordinance. In the case of urgency such a notice can be fixed at a conspicuous place or some object on the building.
8. If the Authority feels that a listed building is not being maintained properly and needs repair etc. the Authority can serve an 'enforcement or repair notice' to the owner and the occupier after giving him a show-cause notice. The owner and occupier can appeal to the Board of the Authority (other notices are issued by the Vice Chairman). The Boards' decision is final. Violation of 'enforcement or repair notice' is punishable and the Authority can themselves carry out the repairs and recover the expenses from the owner.
9. Listed buildings can be compulsorily acquired under the Land Acquisition Act, 1894 by the Authority or by the Government. A difference is made here from the Archaeological Monuments Act. Archaeological Monuments can be acquired compulsorily only if they are in danger. In the case of listed buildings such a requirement is done away with the notification of the list for public objections and suggestions and the official notice in the Gazette that it has been listed are respectively given the status of Section 4 and Section 6 notification under the Land Acquisition Act.
10. In the case of a proven deliberate neglect of the building by the owner, acquisition can be made with minimum compensation.
11. The Act also provides for a differential compensation to the owner if a conditional listed building consent or a refusal of such consent affects the owner's rights of property partly.
12. If the listed building consent is not granted the owner can also serve a 'purchase notice' on the Authority requiring the Authority to acquire the building or issue necessary clearance.

Conservation Areas :

The following are the provisions for the protection of areas of historical or architectural importance :—

Areas of archaeological, historical or scenic importance can be declared under three categories as follows (collectively called "controlled areas") : —

1. Conservation areas ;
2. Neighbourhood improvement areas : and
3. Design Zones.

1. Areas within 100 metres radius of protected archaeological monuments and listed local monuments (the first grade listed buildings) can be declared as Conservation Areas. They shall be enforced simultaneously with the notification of the buildings and monuments. In conservation areas there will be control on demolition of buildings, cutting of trees, and advertisements. However, repairs, additions and alterations to buildings do not require permission. All new buildings within the zone will require clearance from the Andhra Pradesh Urban Art Commission.
2. Areas which contain a number of listed buildings and townscape requiring general improvement schemes, shall be declared as 'Neighbourhood Improvement Areas'. The Authority shall take up improvement and conservation proposals for these areas. Specific projects will have to be taken up.
3. Areas where the overall character should be maintained but where a larger degree of new development can take place may be notified as 'Design Zones'. All new buildings in Design Zones must be examined and approved by the A.P. Urban Art Commission.

In all three areas, it is necessary to consult the Andhra Pradesh Urban Art Commission before their delineation. Further it is necessary to make a newspaper notification for public objections and suggestions. In all the three areas advertisements are to be strictly controlled, cutting of trees is prohibited and the Authority is empowered to prepare special zoning regulations for these areas.

ENCLOSURE 'F'

No. 21015/51/83-WI

Government of India

Ministry of Works & Housing

(Works Division)

New Delhi, dated the 11th July, 1985

OFFICE MEMORANDUM

Subject: Constitution of Committee to advise the Government on maintenance and modifications in certain buildings.

The Government have decided to constitute a committee to advise it on matters connected with the maintenance and modifications to Rashtrapathi Bhavan, North and South Blocks and Parliament House buildings. The Committee shall be composed of the following :—

1. Shri K.P. Singh Deo, Minister of State for Personnel & Training, Administrative—Chairman Reforms & Public Grievances and Pensions, New Delhi.

2. Shri Charles Correa, A-9, Mathew Road, Bombay-4.

3. Shri Ravindra Bhan, D-198, Defence Colony, New Delhi-110 003.

4. Miss Rena Ripjit Singh, 76 Sunder Nagar, New Delhi-110 003.

5. Miss Sunita Kohli, 76 Sunder Nagar, New Delhi-110 003.

6. Mrs. Heminder Kaur, 9, Safdarjung Road, New Delhi.

7. Shri Harish Chandra, Chief Engineer (NDZ), C.P.W.D., Nirman Bhavan, New Delhi.

Member Secretary.

2. The Committee shall :—

(a) examine the existing modifications with a view to deciding if some of them should be removed,

(b) act as a Standing Committee to clear any modifications that may be needed in future, and

(c) advise on any special steps that are necessary to maintain the buildings in a proper condition.

Sd./-

(K. KIPGEN)

Joint Secretary to the Govt. of India

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ENCLOSURE 'G'

LIST OF RAILWAY BUILDINGS INCLUDED IN CONSERVATION PROGRAMME

Sl. No.	Railway	Name of the Railway Building
1.	Central	Will be furnished later on.
2.	Eastern	(i) Howrah Station Building. (ii) Old Koilaghat Building in Calcutta. (iii) Divisional Office Bldg., Sealdah. (iv) Divisional Office Bldg., Dauapur. (v) Divisional Office Bldg., Asansol.
3.	Northern	(i) Kanpur Central Station. (ii) Lucknow Station. (iii) Delhi Main Station. (iv) Baroda House (old building). (v) Bikaner Station. (vi) Jodhpur Station. (vii) Aligarh Station (viii) Varanasi Station. (ix) Haridwar Station. (x) Rail Bhavan.
4.	North Eastern	Will be furnished later on.
5.	Northeast Frontier	None of the buildings is of historical importance.
6.	Southern	**Station Buildings** (i) Madras Central. (ii) Madras Egmore. (iii) Coimbatore Junction. (iv) Trivandrum Central. (v) Kanyakumari. (vi) Bangalore Cantonment. (vii) Bangalore City. (viii) Mysore. (ix) Tiruchirapalli Junction. (x) Madurai Junction. **Others Buildings** (i) Southern Railway Headquarters Building at Madras. (ii) Divisional Office Building, Tiruchirapalli. (iii) Divisional Office Bldg., Mysore. (iv) Divisional Office Bldg., Bangalore.
7.	South Central	Will be furnished later on.
8.	South Eastern	(i) S.E. Railway Headquarters Office, Garden Reach, Calcutta. (ii) Old Station Building at Bilaspur. (iii) Institute Building at Chakradharpur.
9.	Western	**Station Buildings** (i) Bombay Central. (ii) Baroda. (iii) Dhrangadhra. (iv) Kota. (v) Sawaimadhopur. (vi) Agra Fort. (vii) Jaipur. (viii) Alwar. (ix) Ajmer (x) Surendranagar. (xi) Rajkot. (xii) Jamnagar (abandoned after Viramgam-Okha B. G. conversion). (xiii) Jamnagar (new station building). (xiv) Morbi. (xv) Porbandar. (xvi) Gondal. (xvii) Junagadh. (xviii) Veraval. **Other Buildings** (i) GLO Building at Church Gate. (ii) DRM's Office, Ajmer. (iii) Zonal Training School, Udaipur.

ENCLOSURE 'H'

STATEMENT GIVING THE POSITION OF THE PASSING OF LEGISLATION ON ARCHAELOGY AND TOWN AND COUNTRY PLANNING IN DIFFERENT STATES/UTs

(AS OF SEPTEMBER 1985)

STATES

1. **Andhra Pradesh**

The Andhra Pradesh Area (Development) Act, 1975 is applicable to the development of urban areas alone in Andhra Pradesh. The Act is modelled on the Delhi Development Act and gives powers for plan making and enforcement and for implementation through Development Authorities for areas which may be extended beyond local authority boundaries. The Hyderabad District Municipal Act. 1955 also has some planning clauses.

The state has also the Andhra Pradesh Ancient and Historical Monuments and Archaelogical Sites and Remains Act, 1960.

2. **Assam**

The State has the Assam Town & Country Planning Act, 1959. The Act was amended in 1984 to enable the constitution of Development Authorities. Certain other amendments to the Act providing for, among other things, the implementation of the Master Plan or development schemes by the Government directly and also for the discontinuance of unauthorised development and its demolition, have been agreed to by the State Government.

The State has also the Assam Ancient Monuments and Archaelogical Sites and Remains Act, 1959.

3. **Bihar**

The following Acts are in force in the State:

(i) The Bihar Restrictions on Uses of Land Act, 1948;

(ii) The Bihar Town Planning & Improvement Trust Act, 1951; and

(iii) The Bihar Regional Development Authority Act, 1981.

The Act provides for the preparation of regional plans, master plans and zonal development plans and for the setting up of Regional Development Authorities. The State Government has recently constituted the Bihar Coal Mining Area Development Authority in addition to the three Regional Development Authorities of Patna, Ranchi and Muzaffarpur.

In the Bihar Town Planning & Improvement Trust Act, 1951 and the Rules framed thereunder there is a provision for the inclusion in the Master Plan of all buildings of architectural, historical or archaeological importance to be preserved. There is a similar provision in the Bihar Regional Development Authority Act, 1981 also but in actual practice very little use appears to have been made of these legal provisions.

4. **Gujarat**

The Gujarat Town Planning and Urban Development Act, 1976 is in force in the State. It came into operation on the 1st February 1978 and is a comprehensive planning and development Act. Urban Development Authorities have been established for Ahmedabad, Vadodara, Rajkot and Surat and Area Development Authorities have been set up for Bhavnagar and Jamnagar. A number of local authorities have also been declared as Area Development Authorities under the Act.

The State has the Gujarat Ancient Monuments and Archaelogical Sites and Remains Act, 1965.

5. **Goa**

A comprehensive Goa, Daman & Diu Town & Country Planning Act is in force since 1976. Three Planning development Authorities have been set up under the Act for the different areas in the State (*vide* notes on Goa in Chapter III for details).

6. **Haryana**

The Acts currently in force are:—

(i) The Punjab Municipal Act, 1911;

(ii) The Punjab Town Improvement Act, 1922;

(iii) The Punjab Development of Damaged Areas Act, 1951;

(iv) The Punjab Peripheral Development Control Act, 1953;

(v) The Punjab Ribbon Development Control Act;

(vi) The Punjab Urban Estates (Development & Regulation) Act, 1964.

The large number of Acts provide for enforcement of Planning regulations in a piecemeal manner and it has therefore been suggested by the Central T&CPO that there should be a comprehensive planning and development legislation. However not much progress appears to have been made. The Haryana Urban Development Authority Act, 1976 is a limited piece of legislation aimed at the elevation of the Urban Estates Department to that of a Development Corporation and does not provide for the preparation of development plans and their implementation.

7. **Himachal Pradesh**

The Himachal Pradesh Town & Country Planning Act, 1977 is in force in the State. The Shimla Development Authority has been constituted for the implementation of the Master Plan of the Shimla Planning area.

8. **Jammu & Kashmir**

The Act currently in force in the State is the Jammu & Kashmir Town Planning Act, 1963. The Act does not provide for comprehensive planning and plan implementation. Though Development Authorities have been established in Srinagar and Jammu a comprehensive Bill has been prepared and submitted to the State Government.

The State has also the Jammu & Kashmir Ancient Monuments Preservation Act, 1977.

9. **Karnataka**

The Act in force in the State is the Karnataka Town & Country Planning Act, 1961 (amendments made upto 1964). Under the Act Outline Development Plans and Comprehensive Development Plans are approved for urban areas. There are a series of other related Acts such as Bangalore Development Authority Act, 1976 and the Karnataka Improvement Boards Act, 1976. Improvement Boards have been constituted in 9 cities, namely, Hubli-Dharwar, Belgaum, Hoispet, Gulbarga, Bijapur, Bellary, Mangalore, Davangere and Shimoga. Mysore City is governed by an earlier enactment called the City of Mysore Improvement Act, 1963. The Karnataka Town & Country Planning Act, 1961 is proposed to be made more comprehensive through amendments which are under consideration of the State Government.

The State has also the Mysore Ancient & Historical Monuments and Archaeological Sites & Remains Act, 1962.

10. **Kerala**

The Acts in force in the State at present are :

(i) The Travancore-Cochin Town & Country Planning Act, 1945, as amended in 1947 and 1975. It is in force in the Travancore-Cochin area of the State. This provides for the preparation of town planning schemes for specific areas and for the creation of the Greater Cochin Development Authority.

(ii) The Travancore Town Planning Regulations, 1932 as amended in 1960 to bring within its fold rural areas in addition to urban areas. This also is in force in Travancore-Cochin Area of the State.

(iii) The Madras Town Planning Act, 1920, as amended in 1975 is in force in Malabar area of the State. The amendment provides for the creation of the Greater Cochin Development Authority as Cochin Fort area is covered by this Act.

11. **Madhya Pradesh**

A comprehensive Planning Act titled the Madhya Pradesh Nagar Tatha Gram Nivesh Adhiniyam, 1973 is in force in the State. It is a comprehensive planning and development Act and provides for the preparation of regional plans, urban area plans and zonal plans and prescribes control on development and use of land. It also envisages preparation of town development schemes by the Development Authorities constituted under this Act. Planning has been centralised under this Act and the State Town Planning Department is the Planning Authority for all the planning areas in the State and the Department is to prepare the development plans.

The State also has the Madhya Pradesh Ancient Monuments and Archaeological Sites and Remains Act, 1964.

12. **Maharashtra**

The Maharashtra Regional and Town Planning Act, 1966 as modified upto the 15th February 1975 is in force in the State. It is a comprehensive planning Act with development functions. It contains provisions, for the preparation of regional, metropolitan, urban and new town plans. It also caters for the preparation and implementation of town planning schemes. In addition, the Special Planning Authorities can be created for implementation purposes.

The Bombay Metropolitan Regional Development Authority Act, 1975 led to the creation of the BMRDA with wide planning and development powers. Other Acts in existence are :—

(i) The Bombay Housing Board Act, 1948;

(ii) The Madhya Pradesh Housing Act, 1950 (as was in force in the Vidarbha Region); and

(iii) The Maharashtra Slum Improvement Act, 1973; and

(iv) The Bombay Building Repair and Reconstruction Board Act, 1969.

The State has also the Maharashtra Ancient Monuments Archaeological Sites & Remains Act, 1961.

13. **Manipur**

The Manipur Town & Country Planning Act, 1975 is in force in the State. This is a comprehensive planning and development Act and under this Act a State Town & Country Planning Board has been constituted and a State Planning & Development Authority has also been formed.

14. **Meghalaya**

At present the Assam Town & Country Planning Act, 1959 has been extended to Meghalaya. As the provisions are inadequate to a more comprehensive draft Town & Country Planning Bill has been prepared by the Central T&CPO at the request of the State Government but it has yet to be brought on the Statute Book.

15. **Nagaland**

The Nagaland Town & Country Planning Act, 1966 which is in force in the State is based on the Assam Town & Country Planning Act, 1959. The State has been advised to have a more comprehensive legislation on planning and development.

16. **Orissa**

The Act in Force in the State is the Orissa Town & Planning & Improvement Trust Act, 1956 (as amended upto 31st January 1976). The Act provides for the improvement, development and expansion of towns in the State. The Director, Town Planning has drafted a Bill on Town & Regional Planning incorporating the basic structure of the model Bill circulated by the Central T&CPO. The Bill is under consideration of the State Government. The Orissa Development Act, 1983, is also in force in the State. It provides for the development of urban and rural areas and undertake preparation, implementation and enforcement of development plans and town planning schemes.

On the Archaelogy side the State has the Orissa Ancient Monuments and Preservation Act, 1956.

17. **Punjab**

A comprehensive legislation titled the Punjab Town Planning Ordinance 1976 had been promulgated in the State but the Ordinance lapsed as the State Government did not get the life of the Ordnance extended beyond 6 months. The other Acts which are in force in the State are :

(i) The Punjab Municipal Act, 1922.

(ii) The Punjab Improvement Act, 1922.

(iii) The Punjab Development of Damaged Areas Act, 1952.

(iv) The New Capital (Periphery) Control Act, 1953.

(v) The Punjab Nangal Township (Periphery) Control Act, 1958.

(vi) The Punjab Slum Areas (Improvement and Clearance) Act, 1961.

(vii) The Talwara Township (Periphery) Control Act, 1961.

(viii) The Punjab Urban Estates (Development and Regulation) Act, 1964.

(ix) The Punjab Housing Development Board Act, 1972.

The State has also the Punjab Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1964.

18. **Rajasthan**

There is as yet no comprehensive planning legislation in the State and planning functions are undertaken under the following acts :

(i) The Rajasthan Urban Improvement Act, 1959; and

(ii) The Rajasthan Municipal Act, 1969.

A comprehensive Town & Country Planning Bill on which the advice of the Central T&CPO has been taken is under consideration of the State Government. The State also has the Rajasthan Monuments, Archaeological sites and Antiquities Act, 1961.

19. **Sikkim**

At present there is no comprehensive planning legislation in the State and the Acts in force are :

(i) The Gangtok Municipal Corporation Act, 1975; and

(ii) The Bazar Committees Act, 1969.

The position is not satisfactory. A Central Team led by the Chief Planner visited the State in 1985 and after discussions at a senior official level a Draft State Planning and Development Authority Ordinance was prepared and sent to the State Government.

20. **Tamil Nadu**

The Tamil Nadu Town & Country Planning Act, 1971 is in force in the State. It is a comprehensive piece of planning legislation and has been amended to provide for the constitution of the Madras Metropolitan Development Authority.

The State has also the Madras Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1966.

21. **Tripura**

The Tripura Town & Country Planning Act, 1975 is in force in the State. It is primarily a planning Act and does not provide adequately for development functions.

22. **Uttar Pradesh**

The Act in force in the State is the U.P. Urban Planning and Development Act, 1973. The Act suffers from several weaknesses in the matter of enforcement of controls over land use and development and on the advice of the Central T&CPO. The State Government prepared a draft comprehensive legislation which has still to be put on the Statute Book. The other Acts in force in the State are :

(i) Town Improvement Act, 1919;

(ii) Municipalities Act, 1929; and

(iii) U.P. Nagar Mahapalika Adhiniyam, 1959.

The State has also the U.P. Ancient and Historical Monuments and Archaeological Sites and Preservation Act, 1957.

23. **West Bengal**

The Act in force in the State is the West Bengal Town & Country Planning Act, 1979. The Calcutta Municipal Corporation Act, 1980 took statutory effect on the 4th January, 1984 replacing the Calcutta Municipal Act, 1951. This can be described as the first serious attempt in revising the municipal laws of a premier Corporation and it is in keeping with the new thinking in the last 30 years with regard to local self government and planning concepts.

The West Bengal Town & Country Planning Act, 1979 designates the Calcutta Metropolitan Development Authority to be a Development Authority for purposes of the Town & Country Planning Act (*vide* Section 17 of the Act).

The State has also the West Bengal Preservation of Historical Monuments and Objects and Excavation of Archaelogical Sites Act, 1957.

UNION TERRITORIES

1. **Andaman & Nicobar Islands**

A draft Bill has been prepared.

2. **Arunachal Pradesh**

No planning legislation exists at present.

3. **Chandigarh**

The Union Territory is governed by the following Acts and Rules :

(i) The Capital of Punjab (Development and Regulation) Act, 1952.

(ii) The Capital of Punjab (Development and Regulation) Building Rules, 1952.

(iii) The Chandigarh (Sale of Sites) Rules, 1952.

(iv) The Chandigarh Trees Preservation Order, 1952.

(v) The Punjab New Capital (Periphery) Control Act, 1952.

4. **Dadra and Nagar Haveli**

The Goa Town & Country Planning Act, 1974 has recently been extended to the Union Territory.

5. **Delhi**

The Delhi Development Act, 1957 provides for powers to the DDA to prepare a plan for Delhi and enforce it through the local bodies like the Delhi Municipal Corporation, New Delhi Municipal Committee etc. The DDA is also the implementing agency under the Act. The experience of the working of the Act has revealed that the existing provisions are somewhat inadequate with regard to built up areas and certain amendments are under consideration.

Planning for the National Capital Region covering certain areas of Rajasthan, U.P. and Haryana along with Delhi is now looked after by a statutory coordinating Board set up at the Central level for planning and monitoring the NCR Plan under the NCR Planning Board Act, 1985.

6. **Laccadive, Minicoy and Amindivi Islands**

No planning legislation exists at present.

7. **Mizoram**

A Town & Country Planning Bill prepared in consultation with the Central T&CPO is under consideration of the UT Administration.

8. **Pondicherry**

Pondicherry is the first UT in India to have a planning legislation on the basis of the model Bill circulated by the Central T&CPO. The Pondicherry Town & Country Planning Act, 1969 has been in force since September 1971 and the statutory bodies, namely, The Pondicherry Planning Authority and the Karaikal Planning Authority constituted under the provisions of the Act, control physical developments in the Pondicherry and Karaikal notified planning areas.

In addition to the above certain Acts were passed in response to the individual requirements of preservation and maintenance of buildings or museums. They are : –

(i) The Jalianwala Bagh National Memorial Act, 1951;

(ii) The Raj Ghat Samadhi Act, 1951 (of the Central Government);

(iii) The Victoria Memorial Act, 1903;

(iv) The Museums Act, 1961;

(v) The Salar Jang Museum Act, 1961; and

(vi) The Antiquities and Art Treasures Act, 1972 (of the Central Government).


सत्यमेव जयते

Urban Transport

Vinod K. Tewari

PROFESSOR & DEAN

Indian Institute of Management, Bangalore


सत्यमेव जयते

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सत्यमेव जयते

CHAPTER 1

INTRODUCTION

Vinod K. Tewari*

1.1 A city is the product of an interaction between the various activities of a place and the people and goods attracted to that place. The extent and intensity of this interaction within the various sub-areas of a city are partly determined by the arrangement and accessibility characteristics of the transport system interlinking the places. Locations with high accessibility become favourable sites for activities associated with urban growth. The activity system within a city and its transport system are interdependent, and reflect the influence of one over the other. A pre-designed transport system can determine the structure of the activity system. Also, the activity system itself provides directions for the development of transport systems. Urban Transport is not only an essential service required to provide accessibility links among the various entities of a city but also a crucial factor which determines the structure and efficiency of the city system. However, the need for transport is greatly felt in the large cities. While it is possible to reach almost every point on foot or by cycling within a reasonable time in small cities and towns, large cities require extensive motorised transport systems to facilitate intra-city movement of people and goods.

1.2 In the ancient period, many cities grew around water transport facilities. Later, the structures of cities were substantially altered with the introduction of rail transport system. Again, the introduction of motor vehicles (road transport) completely changed the structures of cities because of its capability of providing transport linkages to almost every location in a city. Though rail transport has been playing an important role in facilitating movement of people and goods in large cities, the importance of road transport is the greatest in the intra-city transport system.

1.3 The basic function of an urban transport system in a city is to provide accessibility linkages between the city's residential areas and centres of employment on one hand, and producers and consumers of goods and services on the other. Apart from facilitating the movement of people and goods, urban transport compliments other public services, like the collection and disposal of solid weastes, provision and maintenance of sewerage, drainage, water and electricity networks, availability of police and fire protection services, and education and medical facilities. The urban transport also generates, directly and indirectly, a significant proportion of employment in urban areas.

1.4 The composition of urban transport systems in Indian cities is as follows :—

(i) **Mass Transport :** It consists mainly of city bus services and city railway services. However, the conditions of both the services are far from satisfactory. The inadequate capacity of bus services in Indian cities is reflected from long queues at the bus stands, long waiting period, and extreme crowding in the buses. The condition of urban rail services is no different. In addition to extreme crowding, the rail services suffer from obsolete rolling stocks, poor track conditions and faulty signalling.

(ii) **Intermediate Public Transport System :** This consists mainly of private mini buses, taxis, and autorickshaws etc. This system mitigates, to some extent, the problems caused by the inadequacy and inefficiency of public transport services.

(iii) **Personalised Transport :** This covers private fast mode of transport such as motorcycles/scooters, cars, vans and jeeps. A significant proportion of trips, particularly of the non-work trips, in large Indian cities is accounted for trips undertaken by these modes of transport.

(iv) **Walking and Cycling :**—These are important modes of travel in Indian cities. For instance, walking on foot accounted for 56 per cent and cycling 7 per cent of the essential trips in Delhi in 1981. In the case of Bangalore in 1974, the percentages of work trips by walk and bicycles were 49 and 12 respectively. In Madras, about one-third of vehicles entering the central business district each day are cycles. The facilities for walking as well as cycling are generally poor and dangerous in Indian cities.

(v) **Commercial Traffic :**—The commercial traffic plays an essential role in the movement of goods and services in the

* Professor and Dean, Indian Institute of Management, Bangalore Research assistance in the preparation of this report was provided by Shri Amar Nath Pandey.

cities. However, the costs of urban goods transports are generally high because of the delays caused by congestion, wear and tear of commercial vehicles due to "stop-go" conditions, poor road surface, inadequate facilities for transferring goods between different modes of transport and poor storage and marketing facilities, etc.

1.5 Though the circumstances vary from one city to another, there are some basic trends that go to determine the demand of transport in a city. These are :—

(i) increase in population that generates almost a proportional increase in the transport trips;

(ii) spatial spread of the city that leads to expansion of road networks as well as longer trips lengths;

(iii) increase in the household income which enhances the propensity to travel;

(iv) changes in life styles of people which leads to increase in vehicle ownership as well as increase in certain types of trips, such as trips for recreation and social visits;

(v) increase in the industrial and commercial activities of the city that leads to increase in the volume of freight and service traffic; and

(vi) increase in motorized modes of transport.

1.6 The aforesaid factors give rise to a substantial increase in the demand for urban transport which, in turn, leads to more vehicles on the road. A substantial increase in the number of vehicles without adequate expansion of road networks causes widespread traffic congestion. The traffic congestion is caused also by factors, like road-space ratio, urban patterns, mixed mode traffic, extensive uncontrolled parking, high density of interactions, and poor traffic management. The traffic congestion inhibits rapid movement of vehicles which in turn leads to increase in cost of transport and affects the efficiency of transport system. However, the impact of congestion varies from one mode of transport to another. Bus services are likely to be the worst affected ones as the congestion may cause sharp increase in the costs of both labour and fuel. Traffic congestion also causes loss of personal time, discomfort and pollution.

1.7 The inefficiency of a public transport system accompanied with increase in household income and need to travel long distances may cause a sharp rise in the ownership of private motor vehicles which, in turn, may cause further traffic congestion. A recent study has stated that the rapid rate of transport motorization attendant on rapid urbanization and income growth had lead to a situation where two kinds of population explosions have been worrying the authorities in many parts of the world during the recent times—of people and of cars (World Bank, 1976). The growth in the number of automobiles has universally outstripped the growth in population. However, even a low level of motorization is capable of causing serious congestion as private vehicles are used mostly during the peak hours.

1.8 The lack or inadequacy of resources to meet the growing demands of urban transport has been, perhaps, the greatest constraint in solving the transport problems in the cities. The costs of centrally situated land increase congested areas rise sharply with urban growth. The costs of centrally situated land increase rapidly with the city expansion and so also the costs of construction, including the costs of property acquisition, demolition and relocation. The increasing cost of expanding road capacity in the central areas, suggests that much higher benefits would be required to justify the expansion of roads in the central areas. This means that a much higher level of congestion would have to be tolerated before the expansion of roads can be justified. No doubt, transport problems continue to persist despite 25 per cent to about 50 per cent of total public investment of cities allocated to the transport sector. For instance, 26 per cent of projected public investment in Bombay and 48 per cent of that in Calcutta for the period 1972-78 were devoted to the transport sectors of these cities. In addition to such public investments, substantial investments are made also in the private sector —on purchase of vehicles, parking space, petrol pumps and repair shops etc.

1.9 One of the main reasons for the inadequacy of resources for Urban Transport is the low level of fares that are inadequate to meet the cost of transport operation. The urban transport services are generally subsidised in order to maintain certain levels of services. However, there is a limit upto which the transport service can be subsidized. In the long run, a general subsidy removes the incentives to reduce costs, and leads to inefficiency, greater deficits, and yet more subsidies. Ultimately, instead of promoting, it inhibits the improvement and expansion of transport services as it erodes the capital base of transport undertakings. The inadequacy of resources forces continued use of obsolete vehicles which leads to high rate of breakdowns. The repair workshops are, therefore, forced to do emergency repair instead of routine maintenance. Often the vehicles stand idle for want of spare parts.

1.10 The Urban Transport problems are caused also by the lack of coordination among various agencies such as transport undertakings, public works departments or other road building organizations, traffic engineering, and traffic regulating agencies, tele-communication department, electricity supply undertakings, water supply and sewerage boards, town planning authorities and other urban development agencies.

CHAPTER 2

DEMAND FOR URBAN TRANSPORT

2.1 Growth in Urban Population

2.1.1 Though the urban population in India in 1981 accounted for only 23.7 per cent of the total population, in absolute terms it increased six-fold within the past 8 decades. The total urban population in India increased from 25.6 million in 1901 to about 160 million in 1981, and it is expected to go up to about 320 million by the turn of this century. The percentage of urban population increased from 11.0 in the year 1901 to 23.7 in the year 1981. This percentage is expected to go upto about 32 by the end of this century (Table 1). The trend for rapid growth of urban population is reflected from the fact that while the total population in the country increased by only 24.0 per cent during the period 1971-81, the urban population increased by 46 per cent during the same period. During the period 1981-91, while the total population is expected to increase by 22.8 per cent, the urban population is expected to increase by 46.9 per cent. The figures for the period 1991-2001 are expected to be 18.7 per cent and 36.2 per cent respectively (Government of India, 1983).

2.1.2 Along with the growth of urban population, there has been a steady increase in the number of metropolitan cities. The number of metropolitan cities in India was 5 in 1951, which increased to 7 in 1961, 9 in 1971, and 12 in 1981. The number of such cities is expected to be about 23 by 1991. In addition to increase in number, the growth of population, in the existing metropolitan cities as well as those expected to become metropolitan cities by 1981, has been quite high Among the existing metropolitan cities, the annual compound growth rate of population, during 1971-81, ranged between 2.14 per cent in Lucknow to 5.82 per cent in Bangalore. The highest growth rate in population (5.82 per cent per annum) in Bangalore was followed by Jaipur (4.65 per cent), Delhi (4.59 per cent) and Pune (4.03 per cent). On the basis of this high growth rate, it has been estimated that the total population of existing 12 metropolitan cities would increase from 42 million in 1981 to about 60 million in 1991, recording an increase of 42 per cent (Table 2).

2.1.3 In the cities expected to become metropolitan by 1991, the growth rate of population was further higher during the period 1971-81. The annual compound growth rate of population during the period 1971-81 ranged between 2.22 per cent in Coimbatore and 6.43 per cent in Patna. The highest growth rate in Patna was followed by Surat (6.40 per cent), Bhopal (5.73 per cent), Ulhasnagar (5.05 per cent), Baroda (4.77 per cent) and Dhanbad (4.55 per cent). On the basis of growth rate of population in the individual 11 cities that are expected to become metropolitan by 1991, it has been estimated that the size of these cities would range between about 10.6 lakhs (Dhanbad and Ulhasnagar) and 17.1 lakhs (Patna). The total population of these 11 cities is expected to increase from 87.70 lakhs in 1981 to 137.58 lakhs in 1991, recording an increase of about 57 per cent (Table 3). The projections of population for 1991, with regard to the existing metropolitan cities and those expected to become metropolitan by 1991, indicate that the size of metropolitan cities would range between a population of just over one million (Ulhasnagar) and about 12 million (Calcutta). Out of 23 metropolitan cities, while the population of Bombay and Calcutta would be close to 11 and 12 million respectively, there would be as many as 15 metropolitan cities having fewer than 2 million population (Table 2 & 3).

2.1.4 With the increase in population, the number of passenger trips performed by the inhabitants of urban centres has gone up considerably. For example, the estimated number of daily trips in Calcutta went up from 35 lakhs in 1966-67 to 76 lakhs in 1983 recording an increase of 117 per cent, and in Madras from 16 lakhs in 1966-67 to 37 lakhs in 1981, recording an increase of 131 per cent. This substantial increase in daily trips over a short period indicates the tempo of growth in transport demand. At the same time, it may be noted that growth of population in Calcutta as well as in Madras has been low in comparison with the same in metropolitan cities like Delhi, Bombay, and Bangalore.

2.2 Increase in Geographical Spread of Cities

2.2.1 Cities grow in geographical area as a consequence of increase in their population and economic activities. The urban spread first takes place along with transport routes in an axial manner and then in interstitial areas in a lateral manner. The spread is usually accompanied by outward shifts in the pattern of land uses. The growth of employment locations in the periphery results into longer work trip lengths as the dependent population tends to locate itself in the inner city with a desire to reside closer to service facilities. At the same time, certain class

of residents and activities move out to the periphery in order to consume larger space. The growth process results in increase in number of trips as well as trip lengths.

2.2.2 The increase in the area of city with the increase in population is illustrated by the growth of Bangalore City. In 1901, the size of Bangalore City, when its population was 2.28 lakhs, was 28.85 Sq. KM. It increased to 67.34 Sq. KM in 1951 when Bangalore's population was 9.90 lakhs. In 1971, while the population of Bangalore City increased to over 16 lakhs, its size increased to 174.71 Sq. KM. In 1981, the area of Bangalore City increased to over 200 Sq. KM. when its population increased to 29.13 lakhs (Table 4). With the increase in area, the transport network in the city has expanded tremendously entailing longer trip lengths and a greater number of transport vehicles on the road. In Delhi, in the year 1981, the median trip lengths for essential trips (excluding walk trips) varied from 5.7 KM. to 7.8 KMs. for different divisions of the city (Delhi Development Authority, 1986).

2.2.3 However, there need not be one to one increase in the size of population and the area of the city. The expansion of area of a city is though certain with the increase in its population, the extent of the expansion depends on the availability of land for expansion, topographical conditions, land values, building designs and the availability of (existing and expected) transport facilities, etc. It is possible to restrict the expansion of city area to some extent by allowing the construction of multi-storeyed dwelling units and utilizing the vacant land within the existing city limit. But this may not necessarily lead to a substantial reduction in the expected transport demand. The main factor causing demand for transport is need for the movement of people, goods and services. Therefore, the demand for transport is bound to increase with growth in population even if there is a limited expansion in the city area.

2.3 Increase in Household Income

2.3.1 In addition to the increase in population and area of the city, there are other factors also that influence the growth rate of passenger trips. For example, the growth in income enhances the propensity of people to travel. A study revealed that while the rate of per capita daily trip in Delhi city was 0.4 among the lower income group people, it was 1.5 among the higher income group people. Similarly, the rate of per household daily trip among the lower income group was 1.8, and among the high income group it was 8.9 (Table 5). Further, the per capita daily trip in Delhi increased from 0.71 in 1969 to 1.42 in 1981 (Table 6). In Bangalore City, the per capita daily trips increased from 0.314 in 1964 to 6.543 in 1977, and 0.612 in 1982 (KSRTC, Undated).

2.3.2 Choice of mode of travel often depends on the income level of the commuter as also the distance (trip lengths) involved. In Bangalore in 1974, while the overall distance travelled for work by those with monthly household income upto Rs. 150 was less than 2 KMs, the same for those in the income class of Rs. 2,000 and above was 3.4 KMs. The most common mode of travel for work also varied with income. It was 'walk' in the case of workers earning upto Rs. 300 per month, 'Bus' in the case of workers earning between Rs. 300 and Rs. 1,000, and 'scooter/motorcycle' and 'car' for workers in the income classes of Rs. 1,000-1,999 and Rs. 2,000 and above respectively (Table 7 & 8).

2.4 Changes in Life Styles

2.4.1 Changes in life style of urban inhabitants also effect the demand for transportation. Increased urbanization, coupled with higher rates of vehicle ownership, has lead to increase in the mobility of city dwellers, and consequently, increase in number of trips per household. In traditional households where female member of the family are not educated the general tendencies of such members are to remain confined to house and make only occasional social trips. However, in the households where female members are well educated even housewives make frequent trips to social gatherings, recreation centres, shopping complexes, professional and other training centres, and so on. Similarly, with the spread of education there could be a substantial increase in trips by school going children and college students. For instance, the share of education trips in Delhi in the total passenger trips increased from 16.1 per cent in 1969 to 31 per cent in 1981. However, the easy availability of communication facilities, like telephone and television may lead to decrease, to some extent, in the demand for transport.

2.5 Increase in Economic Activities in Cities

2.5.1 Increase in economic activities in a city leads to increase in employment opportunities and production of goods and services which, in turn, results in larger volume of people movement and freight traffic. Also, as a city grows, the intensity of commercial activities in the city core increases and larger numbers of persons and vehicular trips are attracted to the core. All this results in greater demands on the city transport system.

2.5.2 In large Indian cities, there has been a manifold increase in industrial and commercial activities in the past two decades. For example, in Bangalore city, industrial and commercial employment grew at an average annual rate of about 8 per cent, during 1971-81 and lead to a three-fold increase in commercial vehicles during the same period. A survey of traffic volume in Delhi in 1981 showed that the 20

major intersections in Delhi handle more than 50,000 vehicles per day. It was estimated that about 14,500 trucks enter and leave the Delhi Metropolitan area on an average week day. The total freight handled by railways is estimated to be close to 25,000 tonnes a day.

2.6 Growth of Vehicles in Urban Areas

2.6.1 It is a well recognised fact that the population of fast moving vehicles in Indian cities has been growing much faster than the growth of population. This can be attributed partly to factors such as rising income levels of certain section of city inhabitants and partly to the inability of mass transport to keep pace with the ever increasing travel demands.

2.6.2 In Delhi, while the population grew at the rate of only 4.59 per cent per annum during the period 1971-81, the number of fast moving vehicles increased at the rate of 8.20 per cent during the same period, and that of slow moving vehicles at the rate of 6.80 per cent. The per annum growth of fast moving vehicles ranged between 1.50 per cent in the case of taxis and 50.20 per cent in the case of vehicles other than car, jeep, van, taxis, scooters and motor cycles, auto-riskshaws, buses and goods vehicles (Table 9). In the case of Bangalore city, while the annual growth of population between 1971-81 was 5.82 per cent, the average annual growth rate of vehicles was over 23 per cent during the period 1971-72 to 1981-82. The number of motorised vehicles on the roads of the city has increased from 20 thousand in 1961-62 to about 200 thousand in 1981-82 which has further risen to over 300 thousand in 1986. The growth was highest in the case of motor-cycles, followed by omnibuses, others and motor cars (Table 10).

The total population of motorised vehicles (excluding auto-rickshaws) in Calcutta in a period of 13 years (1965 to 1978) increased by 146 per cent, in Bombay within a period of 18 years (1961 to 1978) by 289 per cent, and in Madras by 272 per cent during the same period (Table 11). The trend has been similar in Delhi and Bangalore.

2.7 Purposes of Urban Trips

2.7.1 The details of purpose-wise trips available for various Indian cities show that bulk of the trips performed are of essential nature and the scope to reduce them is limited. A report on transport in Delhi revealed that out of the total person trips made in the city in 1969, work trips accounted for 58.0 per cent, and education trips for 16.1 per cent. The two figures for 1981 were 43.45 per cent and 30.78 per cent respectively (Table 7). Thus, these two purposes accounted for about 74 per cent of the total person trips. In the case of Bombay, in 1970, this percentage was 78. In addition to these two, there could be many other essential purposes for travel such as visit to hospitals, shopping, and so on.

2.8 Modes of Intra-City Travel

2.8.1 In Indian cities, the intra-city travel is performed by a wide variety of transport modes such as walking on foot, bicycle, cycle-rickshaw, auto-rickshaw, motor-cycles and scooters, bus, train and car, etc. In Delhi city, the modal distribution of essential trips in 1981 revealed that 56 per cent of essential trips were performed by walking on foot, followed by mass transport (23.7 per cent), bicycle (7.2 per cent), and, personalised fast modes (7.1 per cent) (Table 12). The modal distribution of work and education trips in Delhi, in 1981, revealed that walking accounted for about 35 per cent of work trips, followed by mass transport (34.8 per cent), bicycle (13.3 per cent), and personalised fast modes (13.1 per cent). As for education trips, walking accounted for 80.1 per cent, followed by mass transport (10.7 per cent) and subscription buses (6.1 per cent). In the case of Bangalore the modal distribution for work trips was : walk (48.7 per cent), bicycle (12.0 per cent), personalised fast modes (7.9 per cent), mass transport (21.7 per cent), institutional bus (9.3 per cent), and others (0.4 per cent). An origin and destination survey conducted in Bangalore city a few years back revealed that the buses of Bangalore Transport Service (BTS) accounted for 48 per cent of the total passenger trip performed in the city followed by bicycles (16.0 per cent) and scooter and motor-cycles (9.0 per cent) (KSRTC, Undated). The conveyance preferred upto 4 KMs were cycles and autorickshaws and for a distance beyond 4 KMs, scooters/motor-cycles and city buses etc.

2.8.2 A comparison of modal distribution of trips in Delhi in 1969 and 1981 revealed that there was a significant change in the share of modes to the total trips made in Delhi. While the share of bicycle decreased from 28 per cent in 1969 to 17.3 per cent in 1981 and that of personalised fast modes from 23.8 per cent to 16.6 per cent, the share of mass transport increased from 40.8 per cent in 1969 to 50.7 per cent in 1981 (Table 13). According to a study sponsored by Hyderabad Urban Development Authority, the modal distribution of trips in Hyderabad city revealed that the share of buses in the trips was highest (34.34 per cent), followed by bicycle (21.93 per cent), walking (19.85 per cent) and scooters (13.98 per cent). The trips made by trains were least, accounting for less than one per cent (Table 14).

2.8.3 Though the share of mass transports to total trips were 50.0 per cent or less in the cities of Delhi, Bangalore, and Hyderabad, they were quite high in Bombay, Calcutta, and Madras. The share of mass transports in these cities in the year 1966-67 ranged between 65

per cent in Madras and 85 per cent in Bombay, and the same in the year 1976-77 ranged between 65 per cent in Madras and 80 per cent in Calcutta. Further, unlike in the cities of Delhi, Bangalore and Hyderabad, the city rail service is an important mode of transport in the cities of Bombay, Calcutta and Madras. The share of trips by rail to the total trips catered by mass transport in these cities in the year 1966-67 ranged between 23 per cent in Madras and 55 per cent in Bombay, and the same in the year 1976-77 ranged between 20 per cent in Madras and 53 per cent in Bombay. The rest of the trips were accounted for by buses (Table 15).

2.8.4 On the basis of modal distribution of passenger trips in Bombay, Calcutta, Delhi, Madras, Bangalore and Hyderabad, it is obvious that in Delhi, Bangalore and Hyderabad where city rail service is not significant, the share of mass transport in the total trips was 50.0 per cent or less. On the other hand, in the cities of Bombay, Calcutta, and Madras where the city rail services have been playing an important role in the intra-city transport system, the share of mass transport in the total passenger trips ranged between 65 per cent and 85 per cent. Does it mean that the introduction of city rail service to the cities where it is not available would help mitigate the intra-city transport problems to a considerable extent? If yes, would it possible to extend the city rail services in near future keeping in view the financial constraints?

CHAPTER 3

URBAN TRANSPORT PROBLEMS

3.1 The demand for urban transport in urban areas in the country has increased manifold during the past decades, far exceeding the very limited supply. As a result, all the large cities in the country face severe transport problems. Although the nature and extent of urban transport problems in a city are closely related to its growth patterns—both temporal and spatial landuse patterns, level and type of economic activities, topography etc., certain types of problems are experienced in almost all cities in the country. These are:—

(i) congestion
(ii) Mixed-mode traffic
(iii) inadequate public transport
(iv) traffic accidents and environmental pollution
(v) lack of coordination between landuse and transport planning.

3.2 Congestion

3.2.1 The problem of congestion afflicts all large cities in the country. The problem is much worse in the central parts of the cities where the average running speeds are as low as 10 to 20 KM per hour. As mentioned earlier, one of the characteristics of the large cities in India has been a rapid spread in the city conurbation area. Consequently, the distance between the CBDs and the peripheral residential areas has been gradually increasing. Further, with the growth of commercial and industrial activities, the utilization of space for business and commercial activities in the CBDs has got intensified. More and more multi-storey buildings are coming up in the CBDs in order to accommodate the growing demand for business accommodation. Thus, while the metropolitan service and business functions have got more and more concentrated in the CBDs. The residential area developed in the outlying peripheries of the cities. The roads originally built in the CBDs were narrow and for slow moving vehicles. These roads are unable to meet the growing demand of road space required for the increasing traffic. The roads are narrow and there is hardly any space for the expansion of these roads. Therefore, there is little scope for providing separate lanes for different modes of transport on these roads. The slow-moving as well as fast-moving motorised vehicles have to share the same carriage-way which results in acute congestion affecting the movement of traffic and efficiency of the transport system.

3.2.2 The traffic congestion is, however, not confined to the CBDs only. In the intermediate and peripheral areas also the traffic congestion is often caused by encroachment of road for commercial and other activities, uncontrolled parking of vehicles, lack of traffic regulation at road inter-sections and at road-rail crossings.

3.2.3 While in the cities of developed countries, the roads occupy 15 per cent to 25 per cent of the developed area, the proportion of urban areas occupied by roads in cities in India is generally below 10 per cent. Calcutta has only 6 per cent of the city area under roads. Even a low density city like Bangalore has only 8 per cent of the area under roads.

3.2.4 In order to overcome the problem of congestion, the traffic regulating machinery often resorts to traffic regulations such as prohibiting certain type of vehicles on busy roads during a specific period of time, and introducing one way traffic on certain roads. While such measures do help in reducing congestion on a particular road during a specific period, they create problems for road users who are forced to divert their vehicles on other roads. Besides, such measures can provide only temporary relief but not a lasting solution. Sometimes, these measures are followed by the creation of additional road-space wherever possible. However, the creation of additional road-space is often not based on demand for transport, existing and likely to be in future, but are on an ad hoc basis. Such piecemeal addition of road-space can hardly solve the problem.

3.3 Mixed-mode Traffic

3.3.1 The traffic on main roads connecting different parts of cities is of a highly heterogenous nature. The wide variety of traffic such as animal drawn carts, bicycles, cycle-rickshaws, mopeds, motor-cycles and scooters, three wheelers, autorickshaws, taxis, private cars, vans and jeeps, buses and trucks all ply on the same road without any separate right of way.

3.3.2 With the increase in population of large cities and spread of city areas, there has been a rapid growth in the population of fast and slow moving passenger as well as goods vehicles. The growing number of different types of vehicles on the road, with limited road-space, have been causing congestion, reduction in speed of traffic, air and noise pollution, and growth in fatal accidents. In order to avoid the mixed-mode situation on the road, the importance of mass

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public transport, like bus is emphasised. It has been estimated that per person road-space required by a bus with 55 seats in motion is 4.5 sq.M. in comparison to 17.5 sq.M. required by a motorcycle, and 40.0 sq.M. required by a car (Prasad 1977). An efficient bus transport system capable of diverting urban commuters from private modes can help in substantial reduction of congestion, pollution and accidents.

3.3.3 However, it is felt that buses alone would not be able to meet the transport demands of large cities in future. The buses themselves would cause a great deal of congestion as a large number of buses would be required for the movement of people. Therefore, there is a need to develop rapid transit system, particularly through railways. The rail services are capable of transporting bulk of commuters at a much faster speed because of separate right-of-way. The usefulness of urban rail services is reflected from the fact that while in Madras, Calcutta and Bombay where city rail services are available, the share of mass transportation in total trips varies from 65% to 85%, while in the cities, like Delhi, Bangalore and Hyderabad where city rail services are insignificant the share of mass transport in total trips with varies from 35% to 50%. It has been estimated that in Bangalore city, even if 120 buses are added every year till 2001 A.D., the Bangalore Transport Service buses would be able to carry only about 50 per cent of the total daily trips expected in 2001 A.D. In other word, the number of existing buses would have to be trebled by then. And this would require substantial expansion of roads in the city. Besides, the rail services automated by electricity can help reduce the use of precious petroleum, pollution, and traffic accidents. While the advantages of rail services are well recognised, the main constraint in development of urban rail services are the requirement of large capital for investment, and shortage of space within the cities, particularly in the central areas.

3.3.4 The intermediate public transport, like taxis and auto and cycle-rickshaws etc. would continue to be important modes of transport in future as only they are capable of meeting the travel requirement of door-to-door, and free-at-will. The bus-services and rail-services are not capable of meeting these demands. From employment point of view, it has been estimated that about 6%, 18% and 19% of population in Delhi, Meerut and Faridabad depend on these transport modes for their livelihood (NTPC, 1980).

3.3.5 As cyling and walking continue to be important modes of travel in large cities, and expected to continue to be so in future, the development of proper and adequate facilities for cycling and walking is emphasised. In small and medium size towns and cities, where the operation of public transport system is generally not expected to be feasible and viable because of the small size of the city, the people have to depend largely on walking, cycling, and other slow moving and fast moving personalised vehicles, and intermediate public transport vehicles like auto-rikshaw and cycle-rickshaw, etc. It has been estimated that the cost of travel per passenger kilometre in medium-sized cities is four to five times of the travel cost in metropolitan cities due to lack of organised mass transportation system (NTPC, 1980). Despite this high cost, the improvement in intermediate public transport in the small and medium sized cities is suggested. The introduction of bus services is, however, suggested on a selective basis and on routes of high density of travel.

3.4 Inadequate Public Transport

3.4.1 The share of public transport in the total trips varies from city to city. While in the small and medium-sized towns the personalised modes and the intermediate public transport modes account for the bulk of vehicular passenger traffic, in the large cities, public mass transport modes, like buses and railways account for the bulk of vehicular passenger traffic. The major constraint in the expansion of public transport in order to meet the growing transport demand has been the inadequacy of financial resources required for capital investment as well as for meeting the costs of operation.

3.4.2 The funds required for intra-city public road transport system are broadly for two purposes—(i) funds required for the construction of roads and their maintenance, and (ii) funds required for capital investment and operations of road transport undertakings. The major sources of finance for the construction of roads in the cities are the plan outlays of the Central Government, State Government concerned, and the municipal or other City Authority. The maintenance expenditures are met out of their revenue budgets. The sources of funds for capital investments for road transport undertakings are the plan outlays of the concerned State Government, surplus generated by the transport undertakings, and the borrowing from financial institutions and capital market. The operational costs are largely met by the revenue generated by the undertakings. However, most of the city road transport undertakings have been incurring losses in their operations. For instance, the revenue earned by the Bangalore Transport Service during the period 1971-72 to 1981-82 ranged between 82 per cent and 94 per cent of the cost (Table 16). In Calcutta, the revenue earned by the city road transport was about 40 per cent of the cost in 1973-74 and 1977-78, in Bombay in the same years it was 85 and 89 per cent respectively, in Delhi it was 58 per cent and 57 per cent, and in Madras in 1973-74 it was 95 per cent. However, in 1977-78, the revenue earned in

Madras was 101.4 per cent of the cost (Table 17). Thus, the proportion of losses in operating city bus transport varies from city to city.

3.4.3 The losses incurred in the operation of city public bus services are generally attributed to the low level of fare charged by the bus undertakings which is not sufficient enough to meet the operational cost of the transport. The need for subsidy is, therefore, justified. It is argued that the absence of subsidy would lead to hike in bus fare which would affect the low-income group people, who would have to resort to walking and cycling for making even essential trips, like the trips to work and education. Indirectly, such a diversion may affect their efficiency at work. Even for the higher income-group people, it is suggested that the hike in bus fare may divert the well-to-do commuters to private modes of transport which would lead to more vehicles on road, congestion, delay and discomfort in travel, more pollution and accidents etc. The losses suffered by the mass transport undertakings (bus) is suggested to be met by charging more the other road users, like the users of private car and other motor vehicles (Prasad, 1977).

3.4.4 However, the data available for Calcutta, Madras, Bombay and Delhi do not support the assumption that the losses incurred by city transport undertaking are mainly because of the low level of fare. Much of the losses can be attributed to the inefficiency of the transport undertakings. For instance, though the levels of fare were same in Calcutta and Madras, the revenue earned as percentage of cost was while only about 40 in Calcutta, it was as high as 95 per cent and 101 per cent in Madras. On the other hand, the percentage fleet utilization in Calcutta was only about 41 to 49 per cent in comparison to about 87 per cent in Madras, the vehicle utilization in KM per bus per day was only 137 to 139 in Calcutta against the same being 217 to 224 in Madras, and the bus staff ratio in Calcutta was 17 to 19 in comparison of the same being 9 to 12 in Madras (Table 17). Therefore, it would not be proper to raise bus fare without examining and improving the efficiency of undertakings.

3.4.5 As for city railway services, they directly come under the Railway Ministry of the Government of India. The funds for the construction, development, and maintenance of city rail services are provided in the plans and budgets of the Railway Ministry. The constraint of funds for city rail services are, therefore, directly linked with scarcity of resources for the development of railways in the country as a whole.

3.5 Traffic Accidents and Environmental Position

3.5.1 The high density of vehicles on the road is bound to cause traffic accidents and environmental pollution, in addition to traffic congestion. Of the total 156 thousand road accidents in the country in 1981, 30 per cent took place in the six largest cities—Calcutta, Bombay, Delhi, Madras, Bangalore and Hyderabad. In a short period of 4 years, 1977-1981, there was 35 per cent increase in fatal accidents in the six cities (Table 18). The highest number of fatal accidents per lakh of population, in 1981, took place in Delhi, followed by Bangalore, Hyderabad, Bombay, Madras and Calcutta. Thus, roads in metropolitan cities are becoming increasingly unsafe for the commuters. The unsafe transport system generates the fear of accident and cause mental stress in commuters themselves and their near and dear ones.

3.5.2. One of the major problems caused by the increase in traffic and traffic congestion is the environmental pollution, particularly air pollution and noise population. The emission of carbon monoxide, sulphur dioxide, and nitrogen oxides pollutants by motor vehicles account for a significant proportion of air pollutants. It has been estimated that over 68 per cent of carbine monoxide and 46 per cent of hydro carbons present in Bombay's atmosphere were due to automobile emission. Also, suspended particulate matter accounted for over 40 per cent of the total emission of pollutants in Calcutta (Srinivasan, 1987). The environmental pollution by motor vehicles depends not only on the extent of motorization and traffic congestion, but also on the quality of vehicles and their maintenance, etc.

3.6 Lack of Coordination Between Landuse and Transport Planning

3.6.1 In order to overcome the intra-city transportation problems in large cities, it is emphasised that the land-use planning and transport planning should go hand in hand. It is emphasised that the transportation problem in urban areas is basically caused by the separation of residence from work places and shopping and services. Much of the transportation problem could be solved if it were possible to establish proper linkages between the places of work/shopping/ services and residence.

3.6.2 The approaches to tackle the transportation problems in the country have been rather half-hearted. The important ones among these are the dispersal of population and economic activities from the city-core to peripheries and development of satelite towns around the main cities. It is implicit in these policies that the provision of adequate infrastructural facilities and dispersal of certain activities to satellite towns, accompanied with a package of incentives and disincentives, would result in the diversion of population and economic activities from the central areas of metropolitan cities, and thereby, influence transport requirement. Also, the dispersal of population and economic activity within a metropolitan area would lead to better distribution of trips and reduce congestion in central areas (NTPC, 1980). However, the experiences of New Bombay and the towns and cities of the

National Capital Region in diverting the population and economic activities from Bombay and Delhi cities do not give any positive indication to this effect. Instead, the development of backbay Reclamation in Bombay and rising sky-line of central areas in Delhi have only further intensified the transport problems in these cities.

3.6.3 The growing transport problems in the large cities are, to a certain extent, attributed to non-implementation of Master Plans (available for a number of cities) that provide for long-term land use planning in the cities. The importance of land-use planing is specially emphasised for small and medium size cities (with population of one to five lakhs, and five to 10 lakhs) as it is still possible to regulate the development of these cities in the desired direction. However, it is pointd out that the land-use plan can influence only on a long-term basis and, therefore, cannot solve the problems faced in the immediate future.

CHAPTER 4

SUGGESTIONS

4.1 The discussion on urban transport demand and the related transport problems, presented in the previous sections, leads to the suggestions given below.

4.2 It is the size of the city that influences to a great extent the nature and extent of transport demand. The size of city depends on the extent of concentration of economic activities that attract people. Therefore, such measures should be taken as would limit the concentration of economic activities in a city to a desirable extent. This would be the key factor in restraining the growing demand for transport in the large metropolitan cities.

4.3 Besides the size of the city, an equally important factor that affects the transport system is the city structure. Attention, therefore, would have to be paid to direct the distribution of population and activities in large cities. The present residential areas and the newly developing residential areas in the outward moving edge of a city should be planned as self-contained (in terms of neighbourhood and local service facilities) sub-areas least dependent on the city core (only for metropolitan service facilities). In this context, application of mathematical urban landuse models for landuse planning is essential (Tewari, 1985).

4.4 The strategy in planning intra-metropolitan activities should be to reduce the transport demand to the maximum extent by the formulation and implementation of appropriate landuse plans. In this context, the factors such as educational facilities, medical facilities, shopping, and recreation facilities etc. that account for the considerable transport demand in cities should be identified and provision be made for all these facilities in newly developing areas as per the size of locality. Further, the construction of multi-storey buildings for accommodating additional business and commercial activities in the central areas of the cities should be discouraged. The overall purpose should be to curtail the requirement of intra-city travel, other than work-travel, to the extent possible.

4.5 Also, the work places should be dispersed, and be located in the areas from where most or majority of the employees reside. Where it is not possible to shift the work place, employees should be encouraged to form housing societies and be assisted in building their own residential houses in the area close to their work-places. The organisations whose staff are liable to be transferred outside the city should be asked to provide residencial facilities to their staff close to their officer or factory.

4.6 Greater attention should be paid to land-use planning and transport planning of small and medium-sized cities (with population 1 to 5 lakhs and 5 to 10 lakhs) where there is still considerable scope for moulding the size and structure of the cities, and thereby regulating the transport demand within a desirable limit.

4.7 In the large Indian cities, the predominant mode of transport, in respect of passenger trips, is the mass transport system—consisting of buses and railways. The efficient mass transport system is essential to meet growing demand of urban transport on one hand, and for reducing the number of pedestrains, slow-moving and fast-moving vehicles on the road on the other. The mass transport should be cheaper enough to attract pedestrains and cyclists, and efficient enough to attract the users of fast moving motor vehicles. The inefficiency of mass transport system may, in the long run, multiply the urban transport problems, as in the cities of industrialised countries in the west. The available information indicates that there is a considerable scope for improvement in the functioning of mass transport system —particularly bus services without any substantial increase in fares. Also, a certain amount of competitiveness is required for improving the city bus services. For this purpose, the monopoly of public bus services in the cities should be removed and private sector bus services should be allowed to compete.

4.8 Bus services alone would not be able to meet the growing demand of transport in the large cities. The introduction and strengthening of railway services in the large cities where they are not available or are not significant would be essential. Therefore, the city rail services require serious consideration and must not be treated lightly on account of existing financial constraints. The priority for the development of urban transport for future should be the bus services in the existing small and medium-sized cities, and fail services in the large metropolitan cities.

4.9 The priority, next to the mass transport system, should go to the development of intermediate public transport system (IPTS) in the large metropolitan cities as well as small and medium sized cities. The development of an efficient IPTS would also help restrain the growth of private motor vehicles on the road. Since IPT modes are mostly in the private sector, they would not require much of the resources from

the public funds. A better provision for loan from banks, parking facilities and traffic regulation from city authorities, and training facilities in the public and private institutions would be of considerable help in the development of IPTS. A cheaper and efficient IPTS in small and medium-sized cities would be very useful in overcoming the existing transport problems, and in reducing the proliferation of private motor vehicles in these cities.

4.10 At present, the private owned vehicles, IPT modes, and the good vehicles, that account for the bulk of growing vehicle population in the cities, are hardly taken into account for the purpose of transport planning in the cities. It is high time that instead of mere mentioning their growing numbers, the implications of the growth of these modes were considered for long-term urban transport planning.

4.11 One of the major problems in the development of urban transport has been the inadequacy of finance. In order to overcome financial constraints in developing urban transport, there should be a provision for the allocation of plan funds for the development of urban transport in the national plan and state plans. This fund may be channelised through the Ministry of Urban Development at the national level and its counterparts at the state levels, instead of the same being channeled through different ministries and departments, like the Ministry of Railway, Ministry of Surface Transport, and Public Works Departments.

4.12 The urban transport undertakings should be allowed to borrow loans from financial institutions and capital markets. Also, the urban transport undertakings should be allowed to float debentures in the open market.

4.13 The urban development authorities should charge betterment levies from land owners whose land values, in the periphery of the city as well as in the CBDs, have increased because of the access to transport. The funds, thus, mobilised should be allocated for the development of urban transport. Also, the medium-scale and large-scale industrial and commercial establishments should be required to contribute towards the development of transport in urban areas depending on the number of people employed and the volume of goods and service traffic generated by them.

4.14 At last, but not the least, the emphasis should be on reducing the cost of urban transport rather than increasing the fare to meet the ever growing cost of the urban transport. For this purpose, the functioning of transport undertakings should be monitored and their efficiency should be measured on a regular basis and strategies should be evolved to increase the fleet utilization and distance covered, and the minimization of the staff and fuel consumption.

4.15 The use of transport facilities, particularly, road space, should be rationalised in order to overcome the problem congestion in the central areas of a city during the peak hours. For this purpose, the movement of heavy goods vehicles during the peak hours should be restricted, and the private road users particularly car owners should be charged higher road taxes through seasonal or daily road permits.

4.16 Wholesale markets, ware houses, and parking and servicing facilities for heavy goods vehicles should be developed in the periphery of city so as to minimise the entry of such vehicles in the central areas of the city.

4.17 Transport problems in urban areas is caused also by the pedestrians who have to cross different roads while doing shopping etc. Efforts should be made to develop shopping complexes with a view to minimise the movement of people along and across the roads. Wherever such an alternative is not possible subways should be constructed across the roads.

4.18 To some extent, the transport demand can be reduced by improving the telecommunication facilities. A good network of telephone facilities, particularly, public telephone booths can greatly reduce the movement of people for enquiring from the banks, railway and bus stations, hospitals and other service offices. After all, the ultimate aim should be to increase accessibility and not mere mobility. In this regard, the recently introduced public telephone booths run by handicapped persons merits consideration for future.

4.19 In view of the poor performance of public transport undertakings, it may be worthwhile to try private transport undertakings in running the city transport services. The government can concentrate on the formulation of transport policies, plans, their implementation, and the regulation of traffic. This would not only reduce the burden of government department but would also help in mobilising funds from public for the development of urban transport.

4.20 There is a greater need for bringing in modern management culture in the organisations responsible for the urban transport sector. These organisations generally lack the managerial, financial and technical skills to cope with the complexities and magnitude of transport problems in large cities. Particular emphasis needs to be placed on inter-agency coordination among the various organiations involved in the provision of transport services and also those responsible for land use planning. Urban transport plans must be integrated with land use plans.

TABLE 1

Growth of Towns and Urban Population in India

Census Year	No. of Towns	Total Urban Population (in Million)	Percent Decade Variation	Percent Population to Total
1901 . . .	1834	25·6	..	11·0
1911 . . .	1776	25·6	0·0	10·4
1921 . . .	1920	27·7	8·2	11·3
1931 . . .	2049	33·0	19·1	12·2
1941 . . .	2210	43·6	32·1	14·1
1951 . .	2044	61·6	41·2	17·6
1961 . . .	2330	77·6	26·0	18·3
1971 . . .	2531	107·0	37·9	20·2
1981 . . .	3245	156·0	45·8	23·7
1991* . . .	NA	236·0	50·6	27·7
2001* . .	NA	320·0	36·2	31·0

*Projected figures.

Source : Government of India (1983).

TABLE 2

Population of Metropolitan (Million-Plus) Cities

City	Population 1981 (in Million)	1971-81 Annual Growth Rate(*)	Projected Population for 1991*
Calcutta . . .	9·17	2·69	11·96
Greater Bombay .	8·23	3·26	11·27
Delhi . . .	5·71	4·59	8·96
Madras . . .	4·28	3·04	5·75
Bangalore . . .	2·91	5·32	5·12
Hyderabad . . .	2·53	3·48	3·57
Ahmedabad . .	2·51	3·70	3·65
Kanpur . . .	1·69	2·85	2·23
Pune . . .	1·68	4·03	2·49
Nagpur . . .	1·30	3·39	1·81
Lucknow . . .	1·01	2·14	1·24
Jaipur . . .	1·00	4·65	1·59
TOTAL .	42·00		59·64

*Using their own growth in decade 1971-81.

Source : Government of India (1983).

TABLE 3

Cities Expected to Cross One-Million Population Mark by 1991

	Population 1981 (in thousand)	Annual Growth Rate(%) during 1971-81	Projected Population (in Thousand) in 1991*
Coimbatore . .	917	2·22	1142
Patna . . .	916	6·43	1709
Surat . . .	913	6·40	1688
Madurai . . .	904	2·42	1149
Indore . . .	827	3·98	1219
Varanasi . . .	794	2·72	1307
Jabalpur . .	758	3·53	1073
Varoda . . .	744	4·77	1183
Dhanbad . . .	677	4·55	1055
Bhopal . . .	672	5·73	1174
Ulhasnagar . .	648	5·05	1059
TOTAL .	8770		13758

*Using individual growth rate.

Source : Government of India (1983).

TABLE 4

Growth of Population and Area of Bangalore Metropolitan City

Year	Population (lakhs)	Area in Sq. Km.
1901	2·28	28·85
1911	2·60	60·35
1921	3·11	60·35
1931	3·96	67·34
1941	5·10	69·93
1951	9·91	67·34
1961	12·07	119·21
1971	16·64	174·71
1981	29·13	264·32

Source : Bangalore Development Authority (undated) and KSRTC (undated).

TABLE 5

Trip Rates in Delhi by Income Levels

Monthly Income (Rs.)	Trip/ Person	Trip/ Household
100- 149	0·40	1·83
750 999	1·00	6·20
2000--2500	1·50	8·88

Source : Prasad (1977).

TABLE 6

Urban Trips Per Capita Per Day in Delhi, 1969 and 1981

Trip Mode	1969	1981
Walk Trips . . .	0·244	0·696
Vehicular Trips . . .	0·466	0·722
TOTAL TRIPS .	0·710	1·418

Source : Delhi Development Authority (1986).

TABLE 7

Monthly Income and Mode of Travel for Work. Bangalore 1974

Monthly Income (Rs.)	Most common mode	Modes of Travel used by 15% or more workers
0 -49	Walk	Walk (17%), Bus (17%)
50 -149	Walk	Walk (79%), Bus (17%)
150—299	Walk	Walk (60%), Bus (23%), Cycle (15%)
300 -499	Bus	Walk (33%), Cycle(17%) Bus (47%)
500—749	Bus	Walk (21%), Bus (50%), Scooter/Motor cycle (15%)
750 -999	Bus	Walk (15%), Bus(37%), Scooter/Motor cycle (36%)
1000 -1999	Scooter	Bus (28%), Scooter/ Motorcycle (44%), Car (15%)
2000	Car	Scooter / Motorcycle (17%), Car (63%)

Source : Prakasa Rao & Tewari (1979).

TABLE 8

Growth of Vehicles in Delhi

Vehicle Type	Vehicle (in 000)		Annual Growth rate (%) between 1970-81
	1970	1981	
Car, Jeep & Var.	85·3	124·3	3·44
Taxis	5·2	6·1	1·50
Scooters & Motorcycles	112·5	367·9	11·25
Auto Rickshaw	11·7	21·1	5·50
Goods Vehicles	19·0	38·4	6·67
Bus	4·9	8·6	5.10
Others	4·6	30·0	50·20
All Fast Vehicles	243·2	596·4	8·20
Bicycles	625·0	1100·0	6·90
Others	12·3	13·0	0·50
All Slow Vehicles	637·3	1113·0	6·80

Source : Delhi Development Authority (1986)

TABLE 9

Growth of Vehicles in Bangalore City

Vehicle Type	Number of vehicles			Percentage growth between		
	1961-62	1971-72	1981-82	1961-62 & 1971-72	1971-72 & 1981-82	1961-62 & 1981-82
Motor Cycles	4332	27566	129034	636·3	468·1	2978·6
Motor Cars	5892	15062	33566	255·6	222·9	569·7
Auto Rickshaw	580	5538	10494	954·8	189·5	1809·3
Motor Cab	356	822	1247	230·9	151·7	350·3
Omni Bus	99	517	1760	522·2	340.4	1777·8
Stage Carriage	2702	1488	3044	55·0	204·6	112·7
Goods Vehicles	3372	4777	9569	141·7	200·3	283·8
Others	2629	3623	8504	137·8	234·7	323·5
TOTAL	19962	59393	196969	297·5	331·6	986·7

Source : KSRTC (Undated).

TABLE 10

Growth of Motor Vehicles in three Metropolitan Cities

Motor Vehicle*	Calcutta			Bombay			Madras		
	1965	1978	% Change	1961	1978	% Change	1961	1978	% Change
Car, Jeep & Station Wagons	36,718	80,804	220·1	39,910	137,407	344·3	13,813	27,795	201·2
Motorcycles & Scooters (Two Wheelers)	5,727	33,917	592·2	6,576	62,687	953·3	4,809	40,765	847·7
Taxis	4,434	7,089	159·9	6,370	23,703	372·1	..	2,496	..
Bus, (Standard, School Mini)	3,208	4,473	139·4	1,339	3,454	258·0	505	1,819	360·2
Trucks, Tractors, Trailers, Tempos and Delivery Vans	11,797	25,792	218·6	13,433	35,496	264·2	2,328	5,378	231·0
TOTAL	61,884	152,075	245·7	67,628	262,747	388·5	21,455	79,771	371·8

*Auto-rickshaw not included because of inadequate data.

Source : NTPC (1980).

TABLE 11

Distribution of Person Trips by Purpose, Delhi & Bombay

Purpose	Delhi		Percent Variation	Bombay
	Percent Trips 1969	Trips 1981	1969-81	Percent Trips 1970
Work . . .	58·00	43·45	—25·09	62·0
Education . .	16·10	30·78	91·18	14·2
Others . . .	25·90	25·77	0·50	23·8
TOTAL . .	100·00	100·00	—	100·00

Source : Delhi Development Authority (1986), Srinivasan and Pandakur (1985)

TABLE 12

Modal Distribution of Urban Trips, Delhi and Bangalore

Mode	Percent work trips in Delhi 1981	Percent education trips in Delhi 1981	Percent essential trips in Delhi 1981	Percent work trips in Bangalore 1974
Walk . . .	34·9	80·1	56·2	48·7
Bicycle . . .	13·3	0·7	7·2	12·0
Personalised Fast Modes.	13·1	0·4	7·1	7·9
Mass Transport .	34·8	10·7	23·7	21·7
Subscription Bus .	2·2	6·1	4·0	9·3
Others . . .	1·7	2·0	1·8	0·4
TOTAL .	100·0	100·0	100·0	100·0

Source : Delhi Development Authority (1986) and Tewari (1985)

TABLE 13

Modal Distribution of Trips, Delhi in 1969 and 1981

Mode	Percentage of total persons trips in		Percentage change
	1969	1981	1969-81
Bicycle . . .	28·0	17·3	—3·18
Personalised fast modes	23·8	16·6	—2·39
Hired fast modes .	5·2	3·6	—2·59
Hired slow modes .	2·2	2·8	2·27
Mass transport . .	40·8	50·7	2·02
Subscription bus .	..	9·0	..
TOTAL . .	100·0	100·0	..

Source : Delhi Development Authority (1986)

TABLE 14

Modal Distribution of Trips in Hyderabad City

Mode	Percentage share of trips
Walking	19·85
Bicycle	21·93
Cycle-Rickshaw	4·82
Auto-Rickshaw	2·44
Scooter	13·98
Bus	34·34
Car	1·37
Train	0·75
Others	0·52
TOTAL	100·00

Source : Hyderabad Urban Development Authority (Undated)

TABLE 15

Percentage Share of Trips catered by Mass Transport, Rail and Buses in the four Metropolitan Cities

Years	City			
	Bombay	Calcutta	Delhi	Madras
Percentage share of mass transport in total trips				
1966-67 . .	85·0	80·0	41·0	65·0
1976-77 . .	75·0	80·0	43·5	65·0
Percentage share of trips by rail to total trips by mass transport				
1966-67 . .	55·0	25·0	4·0	23·0
1976-77 . .	53·0	25·0	4·0	20·0
Percentage share of trips by buses to total trips by mass transport				
1966-67 . .	45·0	75·0*	96·0	77.0
1976-77 . .	47·0	74·5*	96·0	80.0

*it includes tram service as well.

Source : Government of India (1980)

TABLE 16

Yearwise Details of Cost and Revenue of Bangalore Transport Service

Year	Revenue (Rs. in lakhs)	Total cost (Rs. in lakhs)	Revenue —cost	% of Revenue to cost
1971-72 .	277·88	326·58	—48·70	85·1
1972-73 .	330·08	365·79	—35·71	90.2
1973-74 .	369·62	435·19	—65·57	84.9
1974-75 .	467·72	535·91	—64·23	87·3
1975-76 .	574·47	664·41	—89·94	86.5
1976-77 .	742·45	825·54	—83·09	89.9
1977-78 .	845·45	972·52	—127.86	86.9
1978-79 .	897.64	1025.50	—127.86	87.5
1979-80 .	1143.49	1221.12	—77.67	93.6
1980-81 .	1362.21	1573.94	—211.76	86.5
1981-82 .	1726.43	2111.44	—385.01	81.8

Source : KSRTC (Undated)

TABLE 17

Performance Indicators of City Bus Undertakings

City Bus Undertaking/year	Fleet Utilisation (in %)	Vehicle Utilization (KMs per bus per day)	Bus staff ratio	Average fare level (paise per KM)	Operating Cost (paise per) KM)	Revenue earnings (paise per KM)	% of revenue to operating cost (per KM)
C.S.T.C. (Calcutta)							
1973-74	40·6	137	18·8	4·00	436	176	40·4
1977-78	48·7	139	16·8*	5.00	570*	222*	38.9
B.E.S.T. (Bombay)							
1973-74	91·0	218	9·2	4·25	236	201	85·2
1977-78	93·0	222	14·3	6·67	362	321	88·7
D.T.C., Delhi							
1973-74	70·9	179	12·9**	3·00	220**	127*	57·7
1977-78	73·2	228	11·1**	3·00	279**	159*	57·0
P.T.C., Madras							
1973-74	87·3	224	11·9	4·02*	158	150	94·9
1977-78	86·7	217	9·1	5·20	220	223	101·4

* The data are for the year 1975-76.
** It includes the staff and their costs etc., provided to private buses operating under D.T.C.
Source : N.T.P.C. (1980)

TABLE 18

Road Accidents in Selected Metropolises in India

City	Total Accidents		Persons Killed		Persons Injured		Fatal Accidents per lakh population in 1981
	1977	1981	1977	1981	1977	1981	
Calcutta	10,611	8,268	358	400	3,783	2,921	4·4
Bombay	25,743	23,161	660	673	9,545	6,879	8·2
Delhi	4,022	4,384	694	1,072	3,874	3,782	18·8
Madras	5,177	5,878	199	339	2,811	3,348	7·9
Bangalore	3,523	4,279	247	366	2,931	3,581	12·6
Hyderabad	965	815	210	227	876	588	9·0
TOTAL	50,041	46,785	2,368	3,077	23,820	21,099	9.4
ALL INDIA	136,942	156,268	20,138	27,265	95,575	118,116	—
Percent in the 6 cities	36·5	29·9	11·8	11·3	24·9	18·0	—

Source : Ministry of Shipping and Transport (1982)

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सत्यमेव जयते

Energy in the Context of Urbanisation

TATA ENERGY RESEARCH INSTITUTE
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PROJECT TEAM

Project Co-ordinator : Dr. R.K. PACHAURI

Report on different sectors has been prepared by :

* **Household Sector**	:	Ms. CHARU PURI
* **Transport Sector**	:	Ms. G. VARADA RAJ
* **Industry Sector**	:	Ms. CHARU PURI
* **Commercial and Services Sector**	:	Ms. CHARU PURI

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सत्यमेव जयते

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सत्यमेव जयते

CHAPTER 1

INTRODUCTION

The subject of this report covers certain issues which are critical to the enunciation of any set of policies for urbanisation. Yet the subject of energy has hardly been considered in the context of urbanisation in earlier efforts dealing with this subject. Consequently, there is a glaring lack of data on energy use related to specific urban activities. While energy as an element of development planning has received adequate attention in the past, this was unfortunately limited to the extent of looking at supply options only. In other words, energy planning in this country, as in several others, has suffered from a distinct supply orientation. This uni-directional approach has not changed even in the wake of the two oil price shocks that the world suffered in 1973-74 and 1979-80, even though there is much greater awareness on the importance of a change in direction. There is now a clear case for integrating energy demand management options with supply options. Policies for urbanisation and the choices exercised therein are an important element of energy demand management for the future.

The interim report of the Commission states that "the Commission has taken special note of this because when it comes to suggesting future urban strategy, the existing urban equilibrium should form the basis, through appropriate policy interventions, for creating a future urban pattern in which the spatial distribution of settlements and their hierarchial inter-relationship can be further strengthened". Essentially our effort in this report is to look at energy as an element of infrastructure, because as the interim report of the Commission has pointed out not doing so could lead to distortions arising out of an inadequacy of infrastructure. Again referring to the Commission's interim report, energy can be seen as a priority sector in the context of urbanisation. Before we deal with specific sectoral issues related with urbanisation, it would be useful to view the problem of energy at the national level. The Tata Energy Research Institute has developed over the past five years a very detailed energy economy model called the TERI Energy Economy Simulation and Evaluation (TEESE) Model. This model has been used by us for arriving at future projections of demand by each particular end-use. The overall growth of the country's population and the patterns of development that we have embarked on have placed an enormous strain on the country's energy sector, which become clear when we view the energy challenge on the basis of future projections. While it is important in the context of urbanisation to see how demand for energy should be met in urban activities only, it must be noted that urban areas are generally moving towards a high energy intensity growth path, while even the minimum energy needs in rural areas are sometimes not met. It must also be remembered that the requirements of conventional energy sources at the turn of the century would be enormous and difficult to meet, given the constraints of capital and other resources that confront the Indian economy. The TEESE model has been used by us to provide a backdrop of the overall energy scenario in the country against which urban issues can then be investigated in detail.

The TEESE Model defines demand for energy as the demand for the service which is being provided by energy, thereby making it possible to study in great detail the substitution possibilities that exist for a particular end-use service demand. For example, in the case of the transportation sector we could differentiate between passenger and freight transportation, demand for which could be met by various modes such as trucks, railways, buses, motor cars, three wheelers, two wheelers and so on.

The TEESE Model optimises the supply options related to demand corresponding to specific levels of economic growth. The growth parameters are taken as given by the Planning Commission in their input-output tables and the energy supply mix is determined on the basis of efficiencies of end-use devices, energy supply costs, energy availability, costs of the end-use devices and so on.

This model was run for the year 2000 to obtain the levels of energy demand measured in terms of end-use requirements (Table 1.1). The optimal solution that was so obtained was compared with the projections made by the Energy Demand Steering Group of the Planning Commission (Table 1.2). From the rates of growth for specific end-use activities listed in Table 1, it is seen that major growth in demand relates to the industrial sector, a 6% rate of growth for irrigation purposes and a fairly high rate of growth in domestic end-uses including cooking, refrigeration, T.V. loads and so on.

On comparing the results for the year 2000 in terms of the optimal supply mix, it is found that in the aggregate the energy supply requirements match closely with the numbers given in the Energy Demand Steering Group Report. As per the TEESE Model the peak load in the year 2000 would be a little above 100,000 MW. There are some differences in the sectoral distribution of these energy forms which are

brought out in Table 1.2. For example, it is found that electricity consumption by the agricultural sector would be higher than has been officially projected. Similarly, industrial consumption of coal is much higher than predicted. As a result of these two factors, demand for petroleum products is well below the projected numbers.

TABLE 1.1

End-Use Energy Requirements

	Teese 1985	Teese 2000	1984-85 to 1999-2000 (%Annual growth)
Street Lighting (10^9LH)	56004·47	123675·5	5·42
Public Water Works C10^9 Kcals)	2732·34	6033·87	5·42
Passenger Transport (Bp-Kms)	1047·63	2207·26	5·09
Freight Transport (Btkms)	352·236	730·573	4·98
Ore Reduction (10^9 Kcals)	113566·5	286562·0	6·36
Fertilizer Feedstock ('000' Tonnes of NH_3)	4958·65	11775·81	5·94
Electricity Feedstocks(10^9 Kcals)	6418·01	21885·69	8·52
Electricity Drive (10^9 Kcals)	62349·2	205015·5	8·23
Process Heating (10^9 Kcals)	86060·5	238110·6	7·02
Irrigation (10^6 Cu. M)	254594·8	618428·1	6·09
Land Preparation . .	..	..	..
Rural Lighting (10^9LH)	32568·9	105245·4	8·13
Urban Lighting (10^9 LH)	48512·60	99836·75	4·93
Rural Water Heating (10^6 LIT)	192870·7	254381·6	1·86
Urban Water Heating (10^6 LIT)	101243·9	247950·2	6·15
Cooking (10^9 Kcals) .	35974·31	201632·2	12·18
Refrigeration (10^9Kcals)	2703·94	11308·15	10·00
Fans (10^9 Kcals) .	13557·26	30084·33	5·46
T.V. Loads (10^9 Kcals)	3036·53	9951·53	8·23

TABLE 1.2

Supply Requirements—199-2000

	Energy Demand Steering Group	Teese Model
1	2	3
Peak Load (MW) . . .	..	100199
Electricity Consumption (TWH) .	454·55	455·12
Industry	280·00	263·84
Household	82·62	82·78
Agriculture	40·90	47·46
Transport	8·28	9·35
Electricity Generation (TWH)		
Utilities	567·57	561·65
Captive (Coal Based) . .	30·00	35·07
Coal (MT)	442·00	436·26
Utilities	244·00†	222·87
Non-Utilities	20·00†	17·87 =240.7

TABLE 1.2—*Contd.*

1	2	3
Industry	150·00	206·00
Household	14·00	7·00
Transport	7·81	0·39
Petroleum (MT) . . .	84·44 --92·88	69·99
Industry	27·8 --29·25	12·26
Household	17·27	23·01
Agriculture	7·74	7·92
Transport		
HSD	22·43 —28·62	20·16
MS	5·7	3·00
ATF	2·7	3·64

Table 1.3 gives the assumptions underlying the renewable energy options that were included in the model run for the year 2000. In the case of photovoltaic lighting, projected panel costs are in the range of $ 100-400 per square metre. We have assumed a cost of $ 250 per square metre in one instance and $ 150 per square metre in another; these are listed in Table 1.4 as well.

Table 1.4 provides a summary report on the optimal utilisation levels of renewable energy options. Thus, it is indicated that under certain assumptions photovoltaics could provide 405 GWH of electricity equivalent to 2 million square metres of panel area for rural lighting. Similarly, the number of solar cookers indicated are 24 million, water heaters 4.4 million, biogas plants (of 4 cu. m. capacity) 8 million and so on.

Table 1.5 gives a summary of the costs and benefits of various renewable energy options. Finally, Table 1.6 lists possible policy actions and directions.

TABLE 1.3

Underlying Assumptions

WIND PUMP

Capital cost	— Rs. 12000
Utilisation	=120 days/year
Assuming 25% reduction upto 2000 Cost/cu.m.	=Rs. 0·11

PV LIGHTING

Conversion efficiency	=10$
Projected PV costs/sq.m.	= $ 100 — $ 400
Assuming a cost of $ 250/m^2 Cost/sq. m.	=Rs. 3250
Cost of production	=Rs. 2·14/kWh
Cost of storage	—Rs. 33·7 kWh

WIND POWER

Other costs/KW	=Rs. 5000
Total cost/kWh	=Rs. 1·10
Assuming cost of windmill/KW in 2000	=Rs. 5000
Cost/kWh	=Rs. 0·81

SOLAR HOT WATER

Collection Area	=2 m^2
Cost of collection	=Rs. 400/m^2
Cost of balance of system	=Rs. 2000/m^2
Cost/Litre	=Rs. 0·03

WOOD GASIFIERS

Conversion efficiency from fire-wood to woodgas	·70%
Cost/m^3 of woodgas	=Rs. 0·44
Cost/m^3 of water output	.

TABLE 1.4

Optimal Utilisation of Renewable Energy Options in 1999-2000

	Lighting	Cooking	Water Heating	Irrigation	Grid Power
Photovoltaics	≤405 GWH ($2\times10^6 M^2$)[1] ≤810 GWH ($4\times10^6 M^2$)[2]				
Solar Cookers		9927*$10^9$3kCal ($24*10^6$)			
Solar Water Heating			57600*10^6 litre ($4.4*10^6$)		
Biogas		50445 93*10^9 kCal ($8*10^6$)			
Woodgas				26351*10^9 kCal ($2.7*106$)	
Wind Pump				90*10^6 cu. m.[5] ($10*10^6$)	
Wind Power					15.6 Twh (8700 Twh)

1. Assuming 5% of rural population is in villages over 20 kms away from existing grid and photovoltaic panel cost at $ 250/m^2.
2. Assuming an additional 5% of rural population is in villages between 10 kms—20 kms from existing grid and PV cost at $ 150/m^2.
3. Assuming that solar cookers would meet atmost 50% of the cooking energy requirements of 10% of the population.
4. Assuming that solar water heaters will substitute for the equivalent of 2000 GWH of electricity used for water heating.
5. Assuming that the woodgas that can be produced is only 50% of the required (26351*10^9 kCal) level.

TABLE 1.5

Benefits of Various Renewable Energy Options (in Rs. Million)

IMPACT OF WINDPOWER	
Costs	11023
Benefits	21219
IMPACT OF IMPROVED CHULAHS	
Costs	23612·55
Benefits	43353·5
IMPACT OF SOLAR COOKERS	
Costs	2570
Benefits	8628·5
IMPACT OF WOOD GASIFIERS	
Costs	13734·52
Benefits	46753·9

TABLE 1.6

Police Actions & Directions

1. Concentrate on systems engineering and cost reduction for PV lighting options.
2. Survey unelectrified villages for electric load and distance from grid.
3. Develop suitable wind pump systems for groundwater irrigation.
4. Develop low cost reliable solar water heaters for varied requirements.
5. Concentrate on development of reliable gasifiers based on agricultural waste.
6. Enact legislation (PURPA type) for grid connection of small power supply.
7. Develop package of regulations incentives/disincentives to promote solar water heating.
8. Organise and enlarge supply of solar cookers.
9. Intensify and extend improved chulah programme.
10. Build up non-government institutions in the renewable energy field.
11. Develop a package of measures to involve industry in future plans.

From the results obtained and the discussion presented above, it is observed that promoting certain renewable energy technologies would result in net benefits to society. Rigidities in transfer of resources allocated for other energy sectors to the renewable energy area would also pose a serious problem.

Several suggestions pertaining to raising adequate resources for the new and renewable energy sources have been put forward. Improving the efficiency and performance of the conventional energy supply industries, and transferring the savings to the renewable energy area, is one possibility. Improving the plant load factor of thermal power stations and reducing time and cost over-runs in commissioning power generation projects has also been emphasized. Although not much can be done in this regard during the Seventh Plan period, this is the right time to start working towards increasing awareness and gathering popular support for a more reasonable resource commitment for renewable energy sources during the Eighth Plan period.

A two-pronged approach of gathering popular support through better publicity in the media, and of acquainting the political leadership in the country with the benefits of the "Soft Energy Path" is seen as a viable course of action.

These, of course, are recommendations that could be made for energy as a whole, but since the growing urban population would place much larger demands on the country's energy supply potential, they are relevant to the future of urbanisation in India. However, the subject requires treatment at a disaggregated level for each sector of urban activities which demand energy. This is attempted below.

CHAPTER 2

HOUSEHOLD SECTOR

2.1 General

For domestic energy planning it is important to understand why particular groups of people in a given location use the amount and types of fuel that they do, and how they are likely to adjust these patterns as their circumstances change. Studies that have been carried out in the past have indicated that domestic energy demand is influenced by :—

(i) income of the household,

(ii) price or personal cost of obtaining a fuel,

(iii) location of the household (i.e. urban or rural),

(iv) the size of the settlement (i.e. size of the city or a village).

These factors have independent and interrelated effects on domestic energy consumption. The earlier studies have largely focussed on the variation in the energy consumption pattern, with respect to income of the household. A few studies have also related domestic energy consumption with the price of a fuel and also to fuel expenditure and total expenditure of the household.

However, in this report we would be looking at the effects of urban size on household energy patterns, which are not well known. One would expect the urban size to have some general influence over the total energy consumed as well as on the type of fuel used i.e. biomass or non-biomass fuels.

The first section of this chapter gives an overview of the trends and patterns of energy consumption. The analysis is based on the available micro-level data from the study "Domestic fuel survey with special reference to kerosene" by the National Council of Applied Economic Research, 1978-89. Results of a few micro-level studies carried out in different cities of India have also been included to evaluate the extent of variation between cities and the change in energy consumption pattern that has occurred over time.

2.2 Fuel Consumption

The use of firewood declines with the increase in the size of the town while the use of kerosene, electricity and LPG increases with the increase in the size of the town. (Table 2.1). This fact emerges more clearly from Table 2.2 which gives the percentage contribution of various fuels for different size of town. However, there are a few exceptions to the general trend. For instance, per capita use of firewood is lower and use of kerosene is higher in the towns with population less than 0.2 lakhs than in bigger towns of population ranging between 0.2—0.5 lakhs. Also, the use of soft coke in the towns of population ranging between 2—5 lakhs is rather low and consumption of other fuels such as cow dung and crop wastes (termed as others) is higher than in towns with population between 1—2 lakhs, contrary to the trend. With the lack of supportive information on prices of various fuels and income distribution in different sizes of the town, it is not possible to explain the deviations from the general trend.

TABLE 2.1

Per capita annual consumption of energy by size of town

(Unit : CR in kgs)

	Over 5 lakhs	2-5 lakhs	1-2 lakhs	0.5-1 lakhs	0.2-05 lakhs	Upto 0.2 lakhs
Firewood	52	57	80	84	94	80
Soft Coke	51	39	57	59	46	35
Kerosene	85	79	53	49	23	40
Electricity	40	26	25	21	15	16
LPG	46	36	19	17	7	4
Others	20	38	35	33	58	68
All fuels	294	275	269	263	243	243

Source : Domestic Fuel Survey with special reference to kerosene, Vol. II, 1978-79, published by NCAER.

TABLE 2.2

Consumption of energy by town-size and type of fuel (per cent)

	Over 5 lakhs	2-5 lakhs	1-2 lakhs	0.5-1 lakhs	0.2-0.5 lak	upto 0.2 hs
Firewood	17.65	20.67	29.64	31.82	38.56	32.92
Soft Coke	17.29	14.24	21.31	22.48	18.84	14.32
Kerosene	28.87	28.62	19.76	18.74	9.51	16.57
Electricity	13.45	9.37	9.22	8.00	6.32	6.67
LPG	15.58	12.99	7.19	6.35	2.89	1.49
Others (Biofuel)	7.16	14.11	12.88	12.61	23.88	28.03
%Commercial energy	75.41	66.16	57.48	55.57	37.57	39.06
%Non-commercial energy	24.59	33.84	42.52	44.43	62.43	60.94

Source : Domestic Fuel Survey with special reference to Kerosene, Vol. II, 1978-79. published by NCAER.

The per-capita fuel composition of household energy used is significantly different for different sizes of towns. Smaller towns have relatively low energy cosumption and they continue to depend upon biofuels for meeting most of their energy needs. Indeed, the pattern of energy consumption in the smaller towns is quite similar to the pattern found in rural areas. This is partly due to the availability of biofuels in the neighbouring villages. Besides, availability of kerosene at controlled prices is much smaller in small towns as compared to cities. The availability of coal/coke, LPG, and electricity is even less. This indicates that if substitution towards greater use of commercial fuels is to be promoted, better distribution systems for these must be established in smaller towns.

2.1.3 Change in fuel consumption

Changes in energy consumption over time are determined by several factors including family size, fuel mix and supply position and prices of different fuels. NCAER in their 1978 study had collected some information from households to establish the broad trends in energy consumption during the previous five years. These households reported on the change in the five years. However, respondents were not able to indicate the changes in the quantities of different fuels used by them. The data presented in Table 2.3 broadly indicate the number of households that have switched over to various alternative fuels. The NCAER has analysed this information only on the basis of the income of the household and not according to the size of the town.

TABLE 2.3

Number of HHs Reporting Shift From Fuel Used Five Years Ago by Major Fuels used at present for Cooking—All India

(Number in thousands)

Urban areas	Fuel used five years ago						
Type of HH & Fuelwood	Soft Coke	Kerosene	Electricity	Fire-wood	LPG	Others	Total
Soft Coke	..	..	..	197 (87.17)	..	29 (12.83)	226 (100.00)
Kerosene	35 (24.14)	..	..	74 (51.03)	23 (15.87)	13 (8.97)	145 (100.00)
Electricity	..	..	..	1 (100.00)	..	..	1 (100.00)
Firewood	9 (13.24)	3 (4.41)	15 (22.06)	..	12 (17.64)	29 (42.65)	68 (100.00)
LPG	127 (45.52)	74 (26.52)	..	75 (26.88)	..	3 (1.08)	279 (100.00)
Others	21 (18.92)	18 (16.22)	..	62 (55.86)	..	10 (9.00)	111 (100.00)
All fuels	192 (23.13)	95 (11.45)	15 (1.81)	409 (49.28)	35 (4.22)	84 (10.12)	830 (100.00)

Sorce : Domestic Fuel Survey with special reference to Kerosene, Vol. II. 1978-79, published by NCAER.

It can be noticed that almost 50% of the households reporting shift to other fuels were using firewood five years back. Almost 50% of these firewood users shifted to soft coke and 18% to Kerosene and LPG respectively. About 23% of soft coke users also have changed their cooking fuel. Surprisingly a large percentage (66%) of households using soft coke previously are now using LPG and the other fuel shifted to is Kerosene with 18% reporting shifts to this fuel. A majority of Kerosene users are now using LPG and there has been a reverse trend also where LPG users have shifted to Kerosene and firewood.

From this analysis it is indicated that in urban areas the ranking of fuel shifted to is (i) LPG (33.61%), (ii) Soft coke (27.23%), (iii) Kerosene (17.45%), (iv) Firewood (7.23%). On the other hand the ranking of cooking fuels shifted from (i.e. previously used and not used now) is (i) Firewood (49.28%), (ii) Soft coke (23.13%), (iii) Kerosene (11.45%), (iv) LPG (4.22%) and (v) electricity (1.81%). This has been shown as Bar Charts in the next page. Shifting from LPG and electricity to other fuels is likely if their supplies fall short.

A very obvious and expected trend that emerges is that households are shifting to a modern form of fuel say LPG and Kerosene. Electricity has not been established as a common fuel for cooking. Another point that can be noted is that there are two steps involved in a shift from traditional fuels to better forms of fuels. Firewood users generally shift first to soft coke and then subsequently to either kerosene or LPG. However, this point cannot be supported totally by statistical data reported by NCAER.

Other information provided by NCAER that we can use for our study is the reasons reported by households for shifting to their present fuel for cooking and this is presented in Table 2.4.

TABLE 2.4

Reasons for shifting to Present Fuel for Cooking—All India (Per cent of households)

	Rise in income	Fall in income	Present fuel has become cheaper	Present fuel not available	Present fuel is more easily available.	Others	Total
Soft coke . . .	17.81	3.51	28.18	11.96	18.05	20.48	100.00
Kerosene . . .	49.91	8.24	2.27	12.74	5.15	21.70	100.00
Electricity . . .	100.00	..	..	..	..	..	100.00
Firewood . .	4.67	22.69	..	..	12.08	60.56	100.00
LPG	36.70	..	4.83	35.27	13.24	9.96	100.00
All fuels . . .	30.69	4.23	11.03	19.33	13.39	21.33	100.00

Source : Domestic Fule Survey with special reference to Kerosene, Vol. II, 1978-79, published by NCAER.

This table indicates that 31% of households shift to alternative fuels because of increase in their income, 33% shift as a result of availability of a new fuel or more easy availability of a fuel already available. The percentage of households affected by the price of a fuel is 11, but this cannot be taken as conclusive, as it is based on the subjective evaluation of consumers.

Rise in income has a positive influence on (i) LPG (38.58%), (ii) Kerosene (27.34%) and Soft coke (17.6%) LPG and soft coke are the two fuels that have been shifted to, as a result of their easier availability, with 47.9 and 28.2 percent of households reporting shifts to LPG and soft coke respectively. Incidentally, the use of these two fuels is highly influenced by changes in their prices as well.

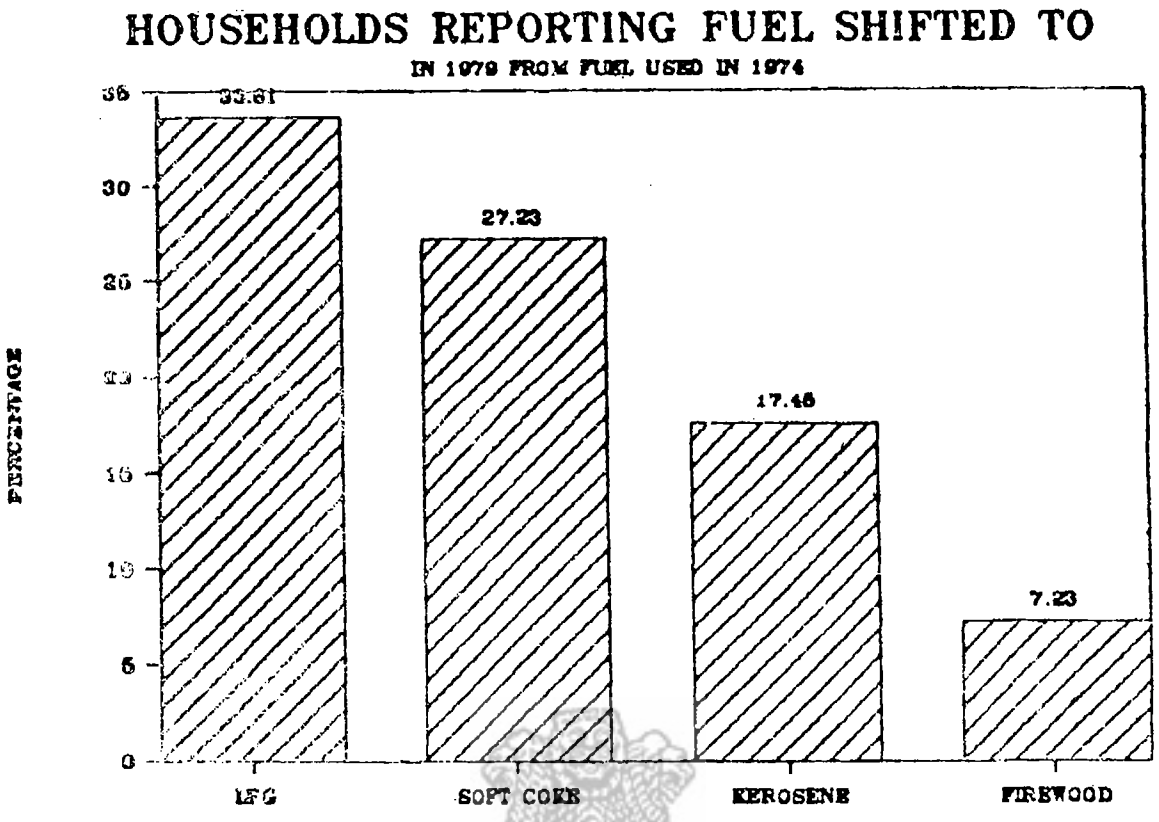
The NCAER report also provides additional information on the reasons of the families not using their preferred fuels. Table 2.5 sums up this information.

TABLE 2.5

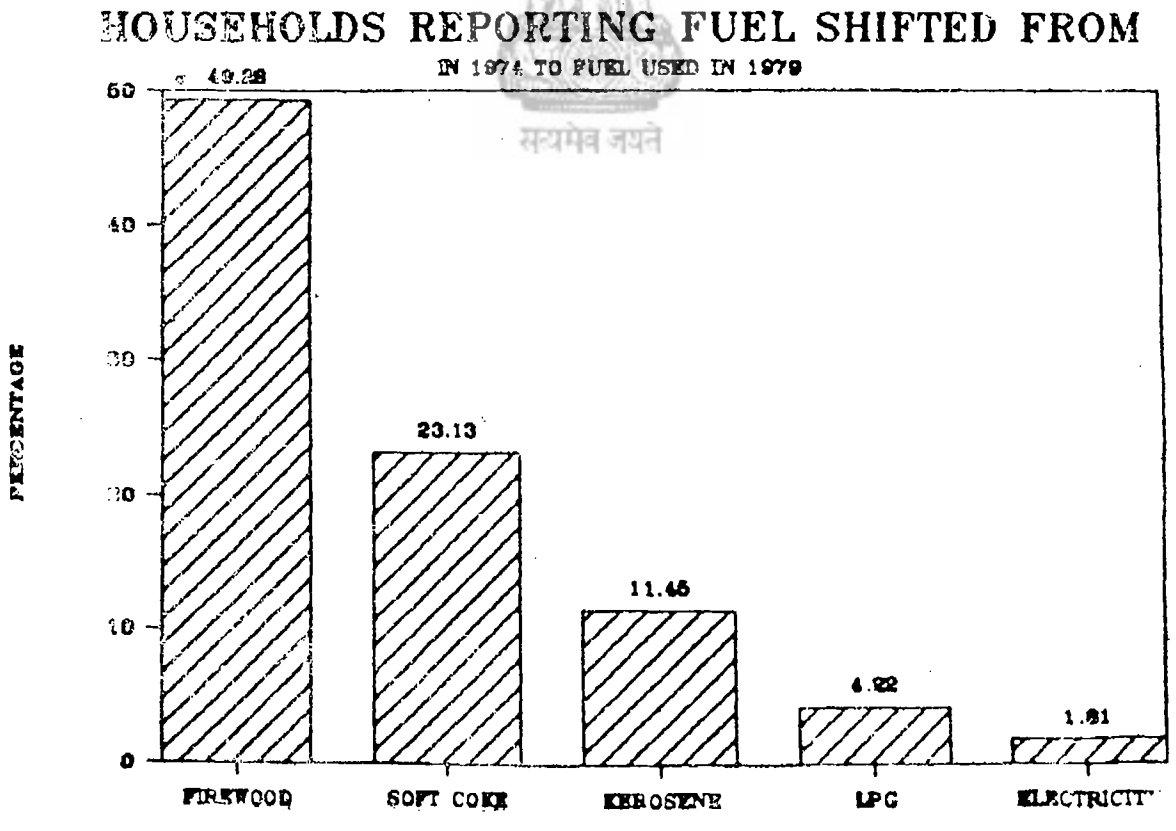
Reasons for not using preferred fuel for cooking (percent of HHs)

Preferred Fuel	Costly	Not easily available	Others	Total (percent of total HHs not using preferred fuel)
Soft coke .	48·60	31·49	19·91	6·61
Kerosene .	69·71	29·7	2·59	7·71
Electricity .	72·49	13·63	13·88	1·62
Firewood .	67·97	7·93	24·1	2·32
LPG .	18·86	74·58	6·56	68·51
Others (bio-fuels)	3·66	48·78	47·56	3·23

Bar Chart - 1



Bar Chart - 2



The above table indicates that 78.5 per cent of households not using their preferred fuel, indicate a preference for LPG. Among those who preferred LPG the constraint on availability was more commonly reported. About 75% of all households gave this as the reason for not using LPG. Households indicating preference for kerosene and soft coke was comparatively low being 7.7 and 6.6 per cent respectively.

Summing up, it appears that non-biofuels have a high preference in urban areas. Two main factors that would substantially increase non-biofuels conusumption are (i) household income, and (ii) their availability. The use of firewood is clearly in decline in per capita terms but not necesarily in the aggregate and firewood users are reported to have shifted over to the use of soft coke and kerosene depending on the income of the family and price and availability of these two fuels. On the other hand a high percentage of soft coke users have shifted to LPG or to kerosene. The above analysis to some extent indicates that soft coke is the fuel used at a transitional phase with firewood users shifting first to this fuel and ultimately to LPG or kerosene.

Among the non-users of LPG in the urban areas a very high percentage (78.5%) of households have indicated a preference for this fuel. Only 7.7 percent of households indicate their preference for kerosene.

However, the most important parameter for energy planning and forecasting is the actual substitution ratio—or the amount of non-biofuels which replaces a unit of biofuel—which cannot be quantified with the above analysis.

As yet there is little firm evidence on which to assess these questions. It might, however, be worthwhile to attempt a broad assessment of these effects using the best available information.

Under this section, we look at a few micro-level studies and try to quantify :—

(i) the increase in the total energy consumed by the size of the city,

(ii) the percentage decline of biofuels with increase in the size of the city,

(iii) change in mix of fuels consumed across income categories.

Here, we would be focusing on a city sizewise analysis.

City size, in an indirect manner, helps to determine the pattern of energy consumption in households. Let us examine how. Firstly, preference for a specific fuel for a given purpose is generally determined by the economic status and life style of the household. And secondly, demand for a preferred fuel is determined by price, availability and accessibility to that fuel.

The direct effects of city size on household energy patterns are not well known, but one can expect them to be partly general and partly location specific. In general, city size is seen as related to levels of economic development, and flows of financial resources. Also, a section of the population in large cities is generally characterised by better living standards of their residents and well developed distribution and marketing systems for fuels such as LPG & Electricity. Hence, energy consumption when compared among the cities of varying population size, is expected to reflect the combined effect of income and availability of a fuel on consumption. To focus on this in the following section we have attempted an analysis of city size and related energy consumption patterns.

In 1987, the Tata Energy Research Institute, New Delhi, conducted surveys in ten cities of India. Although the full results of these surveys have not been released, the data for six cities was specifically analysed for the purposes of this study.

The survey was based on a simple stratified random sample. The urban areas of the country were divided into three categories by size of population.

1. Class—I cities with a population of over one lakh
2. Class—II cities with population ranging between 20001-99999.
3. Class—III cities with population less than or equal to 20000.

On the basis of the fraction of population these cities represent, two class-I cities, three class-II cities and five class-III cities were selected for analysis. The number of households surveyed in each category were as follows :—

Class- I	150
Class—II	100
Class—III	75

For the purposes of our study, from the 'energy consumption' point of view and within the given time constraints, data for two class-I cities, two class-II cities and two class-III cities were analysed. Cities selected from classes I, II and III were Delhi and Madras ; Jaipur and Jabalpur ; Sahibabad and Sanganer, respectively. It should be noted that Sahibabad and Sanganer are satellite towns of Delhi and Jaipur, respectively ; it is expected that they would to some extent reflect the energy consumption patterns corresponding to the major cities they are satellites to.

Table 2.6 gives the number of households that were surveyed in the different income classes of these cities. The average family size of various income classes in these cities is also indicated. It can be observed that Jabalpur and Sanganer were reported to have, on an average, large family sizes of 6.9 and 7.3 respectively, while for the other four cities, this variable ranged between 5.2 to 5.5. It can also be noticed that while for

Madras, Jaipur, Jabalpur and Sanganer the average family size increased with increase in family income, Delhi and Sahibabad were exceptions to this trend and no specific relation was observed between income and family size.

2.4 Energy Consumption Patterns—A comparison across six cities

A comprison of type and quantity of energy consumed in the cities covered has been made in terms of useful energy consumed : that is, the efficiency of the fuel and device used has also been considered. With the limited information available, we have made assumptions on efficiency levels for all the fuels consumed ; further, we assume them to be the same for all income classes and cities. Table 2.7 presents the assumed efficiencies and conversion factors for each fuel or converting from the relevant physical unit to a common energy unit—kilo calories (kCal).

TABLE 2.6

Distribution of households surveyed in different cities/towns according to various income categories

City class	Name of the cities/towns surveyed	Total number of households surveyed	Monthly family income in Rs.	Income class	Number of households surveyed	Average family size	Total population
I	Delhi	150	Upto 1500	IV	8.7	5·9	77
			1500—3000	III	38.0	4.9	281
			3000—5000	II	26.0	5.5	216
			Over 5000	I	27.3	5.0	206
			All		150.0	5.2	780
I	Madras	150	Upto 1500	IV	22.7	4.6	158
			1500—3000	III	49.3	5.5	406
			3000—5000	II	24.0	5.8	209
			Over 5000	I	4.0	5.8	35
			All		150.0	5.4	808
II	Jaipur	102	Upto 1500	IV	35.3	4.8	173
			1500—3000	III	40.2	5.2	212
			3000—5000	II	15.7	5.6	89
			Over 5000	I	8.8	7.0	63
			All		102.0	5.3	537
II	Jabalpur	111	Upto 1500	IV	39.6	6.0	293
			1500—3000	III	33.3	6.4	237
			3000—5000	II	10.8	7.4	89
			Over 5000	I	11.7	11.2	146
			All		111.0	6.9	765
III	Sahibabad	75	Upto 1500	IV	46.7	5.3	185
			1500—3000	III	29.3	6.3	139
			3000—5000	II	13.3	5.4	46
			Over 5000	I	10.7	5.8	46
			All		75.0	5.5	416
IV	Sanganer	75	Upto 1500	IV	26.7	6.9	137
			1500—3000	III	49.3	7.0	258
			3000—5000	II	14.7	7.3	83
			Over 5000	I	9.3	9.4	66
			All		75.0	7.3	544

TABLE 2.7

Conversion factors and efficiencies of various fules

Fuel	Physical Unit	Energy Unit (kCal)	Efficiency (per cent)
Cowdung	kg	2130	10
Firewood	kg	4750	10
Soft coke	kg.	5770	20
Kerosene	l	8547	40
LPG	kg	11750	60
Electrity	kwh	861	85

Source : Sharma and Bhatia (1986)

2.5 Patterns of Energy Consumption Across Settlements and Income Groups

Table 2.8 shows the average energy consumption per capita in the six cities considered. Electricity consumption for 15 electrical devices including fans and lights was estimated. Delhi was observed to have the highest average energy consumption and Sanganer the lowest.

TABLE 2.8

Income group	Fuels	Per-capita Useful Energy Consumed (in 000 kCal)					
		Delhi	Madras	Jaipur	Jabalpur	Sahibabad	Sanganer
1	2	3	4	5	6	7	8
I	Cowdung	..	..	2.8	..	..	..
	Firewood	..	..	4.1	0.9	..	30.9
	Soft coke	..	..	..	..	12.0	..
	Kerosne	40	..	23.9	24.9	10.4	51.8
	LPG	304.6	351.9	214.6	233.2	305.1	107.7
	Total Non-Electrical	308.6	351.9	245.4	259.0	327.5	190.4
	Electrical	759.7	367.4	341.0	288.3	354.2	199.8
	TOTAL	1068.3	719.3	586.4	547.3	681.7	390.2
II	Cowdung	..	0.2	..	..	..	..
	Firewood	..	2.8	..	25.6	..	32.6
	Soft coke	..	..	..	16.9	..	..
	Kerosene	9.4	21.5	7.1	38.2	30.0	19.4
	LPG	278.8	266.0	258.2	188.9	259.0	142.7
	Total Non-Electrical	288.2	290.5	265.3	269.6	289.0	194.7
	Electrical	440.6	258.3	319.1	267.9	239.3	183.0
	TOTAL	728.8	548.8	584.4	537.5	528.3	377.7
III	Cowdung	..	0·3	3·0	..	26·9	..
	Firewood	0·66	2·8	4·3	26·3	3·9	38·9
	Soft coke	3·0	..	0·4	17·7	11·0	8·4
	Kerosene	25·8	32·3	21·2	30·8	64·8	57·7
	LPG	267·9	236·9	206·9	171·9	151·5	56·6
	Total Non-Electrical	297·4	272·3	235·8	246·7	258·1	161·6
	Electrical	324·9	270·1	270·8	228·3	150·0	147·8
	TOTAL	622·3	542·4	506·6	475·0	408·1	309·4
IV	Cowdung	14·6	3·4	1·8	8·2	29·1	0·5
	Firewood	2·7	7·7	21·9	77·8	2·0	43·8
	Soft coke	15·0	0·5	3·5	22·6	41·8	..
	Kerosene	96·4	67·0	84·2	59·92	96·9	47·8
	LPG	46·3	148·9	123·2	96·4	125·2	37·7
	Total Non-Electrical	175·0	227·5	234·6	264·9	295·0	129·8
	Electrical	125·9	155·9	131·0	79·0	100·9	106·1
	TOTAL	300·9	383·4	365·6	343·9	395·5	235·9

TABLE 2.8—*Contd.*

1	2	3	4	5	6	7	8
ALL	Cowdung	1·5	0·9	2·17	3·1	21·9	0·1
	Firewood	0·5	3·6	9·2	41·1	2·2	38·2
	Soft coke . . .	2·5	0·1	1·3	16·1	23·6	4·0
	Kerosene	22·5	34·8	39·4	41·7	69·2	48·6
	LPG	257·6	232·2	189·3	156·6	168·7	71·2
	Total Non-Electrical . .	284·6	271·6	241·3	258·6	285·6	162·1
	Electrical	447·9	248·8	241·5	187·4	164·7	149·3
	TOTAL	732·5	520·4	482·8	446·0	450·3	311·4

Note : Consumption level of non-electrical energy in Sanganer, particularly in the income group IV appears to be very low. The probable reason for this could be the use of other fuels (such as agricultural waste) which has not been accounted for in our analysis.

2.5.1 Non-Electrical Energy

Table 2.8 illustrates the broad effect of city size on household energy. It indicates that the composition of fuels is significantly affected by the size of the city and income. Note especially how the share of LPG and electricity increases rapidly with greater city size and higher income. The reverse trend was observed in the levels of kerosene consumed per capita. While kerosene consumption was seen to be the lowest in class I cities its use progressively increased in class II and class III cities. One reason for this trend is that with rising income families in larger cities are able to switch from other alternative fuels (mainly kerosene) to LPG. This is because large cities have well developed distribution and marketing systems for modern fuels and are favoured when supplies of fuels such as LPG are short. For those who can afford them, the availability and choice of modern fuels is greater in bigger cities. It should be noted that in smaller cities while kerosene is the major fuel, the contribution of other traditional fuels (cowdung, firewood and soft coke) increases with the decrease in city size. The above findings indicate that the switches in the choice of fuel occur usually in two steps from traditional fuels (including soft coke) to kerosene, and then to LPG, depending on the income level and availability. However, use of these traditional fuels did not indicate any specific trend with the size of the city. The variation in the consumption level could be due to their relative availability and prices. An indication of the variation of fuel prices in the six cities is given in Table 2.9.

TABLE 2.9

Average price paid per unit of fuel

	Cow dung (per kg)	Firewood (per kg)	Soft coke (per kg)	Kerosene (per lit)	LPG (per cylinder)
Delhi	0·28	1·18	1·45	2·57	60·63
Madras	0·55	0·96	3·67	2·42	41·36
Jaipur	0·40	0·69	1·18	2·73	63·00
Jabalpur	0·01	0·42	0·71	3·24	79·59
Sahibabad	0·20	1·00	1·20	3·11	63·00
Sanganer	0·20	0·40	1·13	2·61	62·86

A careful examination of the differences in the mix of these three fuels viz. cow dung, firewood and soft coke demonstrate regional differences. Among the most striking features of these regional patterns are :—

1. The use of soft coke in Jabalpur, Sahibabad and Delhi—Jabalpur is a city in a coal producing State, Madhya Pradesh, and this explains higher availability of coal and soft coke in Jabalpur. Sahibadad in the vicinity of Delhi does not have any coal supply constraints. Consequently, Jabalpur and Sahibabal have higher per capita use of coal. In Delhi also, soft coke among the three traditional fuels had the largest share.
2. The use of firewood in Jabalpur, Sanganer, Jaipur and Madras—(in absolute terms firewood consumed per capita in Madras is not high but among the traditional fuels its share is the highest). Madhya Pradesh and Tamil Nadu are among the most densely forested regions of India. This explains higher firewood consumption levels in Jabalpur and Madras. High firewood use in Jaipur and Sanganer is explained by comparing the firewood and soft coke prices in these

two cities. Price of firewood is almost half of soft coke. In fact, it should be noted that while there is much variation in the price of firewood among these four cities, however, in each of these cities it was lower than the price of soft coke.

3. The use of cow dung in Sahibabad— High use of cow dung in Sahibabad confirms that consumers can respond flexibly to fuel scarcity. In this case the scarce fuel is firewood which is conspicuous by its low consumption level and high price. It indicates that as fuels such as firewood and soft coke become more costly they get supplemented by cheaper traditional fuels such as cow dung.

The point that clearly stands out from the above analysis is the effect of prices and availability on consumption of fuels. In the following section we provide evidence on the effects of income on consumption. One may notice from Table 2.1.8 that :—

1. Total per capita use of domestic energy increases with increase in income.

2. Per capita use of LPG and electricity increases with increase in income.

3. Per capita consumption of kerosene generally decreases with increase in income. In fact, kerosene was observed to supplement the use of LPG. While the consumption level of LPG decreases, an increase in kerosene consumption level was noted.

4. Aggregate use of traditional fuels viz. cowdung, firewood and soft coke indicated a negative correlation with the income of the household. Consumption levels of these fuels were observed to increase in the lower income groups.

5. Thus, in each of these cities it was observed that high income groups not only use higher levels of per capita energy but they also use high quality, clean fuels such as LPG and electricity. This is because these groups are in a position to invest in equipment (eg. LPG stoves and cylinder costs) and incur costs of obtaining connections to gain access to electricity.

Summing up, the above analysis indicates that the use of modern fuels is greatest in large cities and least in small cities. This is not a function of city size itself but of the priorities given to fuel distribution and marketing, and hence availability of these modern fuels.

Income of the family and fuel prices are also major determinants of energy demand and extent of fuel substitution. Table 2.9 indicates that prices and availability of traditional fuels vary from region to region and hence the choices of traditional fuels also vary considerably.

2.5.2 **Electricity**

The previous table 2.8 indicates a considerable variation in the per capita use of electricity across city size and income groups. The use of electricity increases with income as well as with the city size. This would be due to changing life styles, ownership of more electrical gadgets etc. Also, it should be noted that while there was a significant difference in the per capita electricity use in the two metropolitan cities surveyed, viz. Delhi and Madras, the difference was only marginal between Madras and Jaipur, even though they are class I and class II cities, respectively. Before drawing any conclusions from this, we should first differentiate between the seasonal electricity demand which reflects the effect of climate on electricity demand, and non-weather related electricity component of demand. For this, the total annual electricity consumption can be categorized into :—

(i) summer demand

(ii) winter demand and

(iii) non-weather demand.

From the survey, information was collected on wattage capacity for various appliances and number of hours they were used in a day (working day and holiday). The list of appliances was categorized as summer gadgets, winter gadgets and non-weather gadgets. In Appendix-I we attach the questionnaire that was used for the survey. On the basis of total capacity and hours of use of each appliance in a day we calculated total monthly electricity consumed. If the appliance was a summer gadget, monthly energy consumed was given a weight of 8 to calculate annual electricity consumed, while for a winter gadget a weight of 4 was given and for non-weather it was 12. These weights are the number of months a particular gadget is expected to be in use, annually. Table 2.10 provides an information related to electricity consumed in summer, winter and non-weather which are the sum of the annual electricity consumed by all summer, winter and non-weather gadgets respectively.

TABLE 2.10

Per-capita, annual use of electricity in six cities

City-class	Class-I		Class-II		Class-III	
City/Income group	Delhi	Madras	Jaipur	Jabalpur	Sahibabad	Sanganer
I						
Winter	211	21	19	71	29	..
Summer	352	266	238	136	213	123
Non-weather	475	215	216	187	242	150
All	1038	502	466	394	484	273
II						
Winter	90	9	38	45	24	0·6
Summer	242	150	218	144	168	116
Non-weather	270	194	180	177	235	133
All	602	353	436	366	3427	249·6
III						
Winter	61	13	21	20	9	..
Summer	164	152	187	111	94	80
Non-weather	219	204	162	181	102	122
All	444	369	370	312	205	202
IV						
Winter	8	1	5	3	13	..
Summer	59	88	81	41	55	3
Non-weather	88	124	93	64	70	112
All	172	213	179	107	138	145

The above table highlights the fact that :—

1. Per-capita use of non-weather electricity generally increases with increase in the city size as well as with income. (Sahibabad was an exception which indicated high electricity use especially in income groups I and II. Income group II in Madras indicated rather low level of consumption).

2. Per-capita use of electricity demanded in winters was very low in Madras and Sanganer. In Madras, it would be low due to a lack of heating load and in Sanganer it could be limited by low availability. A comparison between Jaipur and Jabalpur reveals that in income class I, Jabalpur has almost four times higher per capita electricity use in winter. The probable reason for this could be that families in Jaipur could be using non-electrical energy for heating (space and water heating). In the last section, we had seen that this income group was observed to use cow-dung and firewood besides LPG and kerosene. The reason for this could be low availability of electricity due to diversion of scarce power for agricultural use in Rajasthan.

3. The consumption level of electricity in summer was highest in Delhi, which decreased with increase in income. Madras and Jaipur had almost the same consumption level in income groups I and IV but income groups II and III in Jaipur had much higher consumption. In Sahibabad while income groups I and II had relatively high demand for electricity in summer, it declined very rapidly in the next two lower income groups.

4. Thus, it emerges from the comparison of winter, summer and non-weather demands on electricity that while the non-weather component of electricity is directly correlated with the city size and income, summer and winter electricity demands do not appear related to the city size to the same extent; they are, in fact, largely dependent on climatic conditions. For example, electricity consumption in winter for Madras which has prolonged summer and mild winter is almost half of that in Sahibabad, Jabalpur and Jaipur which have rather cold winters. However, the size of the city may have some influence on electricity use; this can be observed by comparing electricity consumption in cities having identical climatic conditions such as Delhi and Sahibabad, Jaipur and Sanganer.

There are a wide range of electrical devices, including refrigerators, cooling fans, air conditioners etc., which explain the sharp increase in electricity consumption above a certain

income threshold. Table 2.11, indicates the growing ownership of energy intensive electrical appliances in the six cities by four income groups.

A comparison of the ownership pattern of energy intensive electrical appliances indicates that on an average a family in Delhi owns a much greater number of these appliances. In other cities the trend is not well defined. To provide a better insight into the use of electrical appliances, in Table 2.12 we present the average wattage or capacity of all the appliances owned by a family in these cities. The total electrical capacity owned by a family has broadly been categorized into five classes viz.

(i) Summer . . aggregate capacity of summer gadgets—fans, air coolers and air conditioners

(ii) Winter . . aggregate capacity of winter gadgets—heaters, immersion rods, and geysers.

(iii) Lighting . aggegate capacity of fluorescent tubes and incandescent bulbs.

(iv) Entertainment . aggregate capacity of TV (B/W) and colour and VCR.

(v) Others . . aggregate capacity of refrigerator irons, washing machines and exhaust fans.

Delhi, as expected had the highest aggregated ownership of electrical capacity as reflected by average wattage, followed by Madras. Sangner had the lowest corresponding number. The variation in the total capacity owned in terms of kW indicates that while a family in Delhi possessed, on an average, 3.9 kW of electrical capacity, for Madras it was 2.0 kW; for Jaipur, Jabalpur and Sahibabad it ranged between 1.5 to 1.3 kW and for Sanganer it was only 1.0 kW. Variation across income categories in these cities is also well marked, barring the case of Jaipur, although the magnitude of the variation differs. While in Delhi and Jabalpur the difference in the electrical capacity owned by the richest and poorest income group was a factor of 6, in Madras and Sahibabad it was 4, and in Jaipur and Sanganer about 2.

Table 2.12 indicates that among the high income groups a significant proportion of the electrical capacity is accounted by summer and winter appliances such as fans, air coolers, air conditioners, geysers etc. and capacity for lighting, entertainment and others represent only a small proportion. However, with a decrease in income level, the total electrical capacity owned decreases and a rapid decline in the share of aggregate capacity of summer and winter appliances and increase in the share of capacity under 'others' is noted. Also while the percentage share of electrical capacity owned by a family for lighting does not vary too much among the various income groups, in absolute terms it increases with the income level. For example while average capacity for lighting in the highest group in Delhi and Madras is 0.78 and 0.73 kW respectively, in the lowest income group corresponding numbers are 0.17 and 0.27. This could be because of two reasons; firstly, the number of electrical connections for lighting are a function of the dwelling size (no. of rooms); and secondly, the type of lighting device influence consumption itself i.e., whether fluorescent tube or incandescent bulbs are in use. To provide the same amount of illumination, higher electrical capacity is needed when using an incandescent bulb in comparison to fluorescent tube. The previous table indicates that while number of bulbs owned per family in the highest income groups in Delhi and Madras is 12.89 and 10.0 respectively, the corresponding numbers in the lowest income groups are 2.54 and 4.15.

TABLE 2.11

Average number of appliances owned per family

City	Summer Appliances			Winter Appliances			Lights		Entertainment			Others			
	C.F. T.F.	A.C.	Air cooler	Immersion rod	Room heater	Geyser	FT	IB	TV B/W	TV (C)	VCR	Washing machine	Iron	EF	Ref.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I															
Delhi . . .	6·39	1·05	1·44	0·24	1·02	1·15	4·76	10·00	0·22	0·80	0·44	0·32	0·59	0·44	1·19
Madras . .	5·67	0·33	..	0·33	..	0·67	6·00	6·00	..	1·00	..	0·17	0·50	0·17	1·00
Jaipur . . .	6·56	..	1·22	0·33	..	..	3·67	7·78	1·00	0·11	0·22	..	1·33	..	0·33
Jabalpur . .	8·15	0·08	1·15	0·15	0·69	0·46	11·08	6·09	0·46	0·54	0·08	0·15	1·08	0·23	0·77
Sahibabad . .	4·79	0·13	0·88	0·38	0·50	0·63	5·00	9·38	0·38	0·75	0·25	0·63	1·13	0·25	1·00
Sanganer . .	4·00	..	0·71	..	..	..	3·29	7·14	0·43	0·43	..	..	0·57	..	0·29

TABLE 2·11—*Contd.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
II															
Delhi . . .	4·44	0·08	1·18	0·41	0·62	0·54	3·18	7·15	0·46	0·46	0·21	0·44	0·67	0·08	0·85
Madras . .	4·39	0·19	..	0·19	..	0·25	4·03	6·68	0·28	0·68	0·36	0·11	0·69	0·17	0·78
Jaipur . . .	3·94	..	1·06	0·50	..	0·31	4·63	8·31	0·81	0·19	..	0·13	1·25	0·13	0·63
Jabalpur . .	4·50	0·08	0·67	0·33	0·50	0·17	3·75	3·83	0·83	0·17	..	..	0·67	..	0·58
Sahibabad . .	3·59	..	0·70	0·30	0·50	0·40	4·60	6·50	0·40	0·30	..	0·50	0·60	0·20	1·00
Sanganer . .	3·36	..	0·45	0·09	..	..	2·00	5·27	0·82	..	..	..	1·09	..	..
III															
Delhi . . .	4·35		0·61	0·19	0·23	0·33	3·40	5·42	0·54	0·32	0·04	0·19	0·70	0·04	0·79
Madras . .	4·14	0·12	..	0·14	..	0·38	3·93	6·60	0·47	0·45	0·19	0·07	0·58	0·09	0·61
Jaipur . . .	2·73	..	0·22	0·29	..	..	2·56	4·95	0·73	0·02	..	0·10	0·88	0·07	0·34
Jabalpur . .	3·50	..	0·28	0·25	0·08	0·17	3.42	4·69	0·58	0·14	..	0·08	0·78	..	0·36
Sahibabad . .	2·46	..	0·59	0·27	0·05	..	5·00	7·00	0·86	0·05	0·04	0·27	0·91	0·05	0·59
Sanganer . .	2·30	..	0·16	..	..	..	2·22	6·49	0·65	0·22	..	0·03	0·73	..	0·32
IV															
Delhi . . .	1·31	..	0·15	0·23	..	0·08	1·85	2·54	0·62	..	..	0·80	0·38	0·08	0·15
Madras . .	2·27	..	..	0·06	..	0·06	2·03	4·15	0·56	0·15	..	..	0·32	..	0·24
Jaipur . . .	1·19	..	0·22	0·03	..	..	1·50	3·25	0·44	0·08	0·03	0·03	0·67	..	0·08
Jabalpur . .	1·84	0·02	0·04	0·12	0·02	0·02	1·71	2·35	0·39	..	0·01	..	0·55	..	0·02
Sahibabad . .	2·03	..	0·06	0·06	0·06	..	1·20	3·40	0·57	0·05	0·03	0·06	0·43	..	0·29
Sanganer . .	1·65	..	0·10	..	..	..	1·00	4·40	0·80	..	..	..	0·85	..	0·15
ALL															
Delhi . . .	4·64	0·31	0·95	0·27	0·53	0·59	3·58	7·66	0·44	0·46	0·19	0·28	0·63	0·16	0·86
Madras . .	3·82	0·12	..	0·14	..	0·29	3·61	6·17	0·43	0·45	0·18	0·07	0·55	0·09	0·58
Jaipur . . .	2·97	..	0·38	0·24	..	0·05	2·61	5·13	0·67	0·08	0·03	0·07	0·90	0·05	0·29
Jabalpur . .	3·42	0·02	0·32	0·19	0·17	0·14	3·60	3·71	0·51	0·13	neg.	0·05	0·70	0·03	0·28
Sahibabad . .	2·65	0·01	0·39	0·19	0·16	0·12	2·57	5·51	0·61	0·34	0·05	0·24	0·68	0·07	0·55
Sanganer . .	2·44	..	0·24	0·01	..	..	1·96	5·81	0·69	0·15	..	0·01	0·80	..	0·23

C.F.– Ceiling fans
T.F.—Table fans
FT–Fluorescent tubes
IB—Incandescent bulb
EF—Exhaust fan
Ref.—Refrigerator

TABLE 2.12

Average electrical capacity owned by a family (KW)

Income Group	City	Summer	Winter	Lights	Entertainment	Others	Total
1	2	3	4	5	6	7	8
I	Delhi	2·52	2·9	0·78	0·11	0·60	6·91
	Madras	0·99	1·21	0·73	0·10	0·48	3·51
	Jaipur	0·52	0·29	0·45	0·11	0·71	2·08
	Jabalpur	0·74	1·45	0·61	0·08	0·71	3·59
	Sahibabad . . .	0·41	1·11	0·39	0·07	0·63	2·61
	Sanganer . . .	0·34	..	0·45	0·07	0·35	1·21
II	Delhi	0·66	2·02	0·50	0·10	0·71	4·00
	Madras	0·63	0·51	0·48	0·11	0·54	2·27
	Jaipur	0·33	0·73	0·47	0·08	0·69	2·30
	Jabalpur	0·45	1·01	0·27	0·08	0·38	2·19
	Sahibabad . . .	0·23	1·01	0·34	0·04	0·47	2·09
	Sanganer	0·23	0·08	0·28	0·07	0·54	1·20

TABIE 2.12—*Contd.*

1	2	3	4	5	6	7	8
III	Delhi . . .	0·37	0·92	0·40	0·08	0·57	2·34
	Madras	0·52	0·68	0·51	0·10	0·47	2·28
	Jaipur	0·19	0·28	0·32	0·07	0·56	1·42
	Jabalpur	0·20	0·45	0·28	0·05	0·41	1·39
	Sahibabad . . .	0·20	0·28	0·43	0·08	0·59	1·58
	Sanganer	0·14	..	0·36	0·07	0·42	0·99
IV	Delhi	0·09	0·29	0·17	0·05	0·50	1·10
	Madras	0·13	0·13	0·27	0·07	0·21	0·81
	Jaipur	0·12	0·03	0·24	0·05	0·47	0·91
	Jabalpur	0·11	0·12	0·12	0·03	0·23	0·61
	Sahibabad . . .	0·09	0·10	0·15	0·05	0·22	0·61
	Sanganer	0·09	..	0·21	0·07	0·42	0·79

In the 'others' category also while their share in the total electrical capacity increases with decrease in the income level, the actual capacity is found to decrease.

It is interesting to see that in the highest income groups in Delhi and Madras, a family in Delhi is found to own much higher electrical capacity for summer and winter. In the other three income groups while summer electrical capacity is almost comparable for these two cities, Delhi is still seen to possess higher winter electrical capacity than Madras. This can be explained as the result of climatic influences, mentioned in the previous section.

2.6. Expenditure on Energy

Table 2.13 indicates the average per-capita expenditure on non-electrical energy per year in the six cities. A comparison of energy expenditure per person between the four income categories shows that the low income groups spend larger amounts on energy. This finding gets further strengthened when compared on the basis of money spent in buying .1 unit of useful energy. (1 unit='000 kCal). This comparison also indicates that in each income group, residents of larger cities spend lesser amounts in buying one unit of useful energy. In the earlier section it was found that people in larger cities and higher income groups have higher consumption level of LPG. Thus, these people not only get high quality fuel (LPG), but they also spend a much smaller amount on purchasing energy.

TABLE 2.13

Per capita expenditure on energy per year at market prices (in Rupees)

City	I	II	III	IV
Delhi . .	115·7 (0·37)	110·21 (0·38)	123·88 (0·42)	134.15 (0·77)
Madras .	87·98 (0·25)	87·94 (0·30)	88·59 (0·33)	118·41 (0·52)
Jaipur .	111·88 (0·46)	103·80 (0·39)	107.87 (0·46)	123·86 (0·53)
Jabalpur .	136·38 (0·53)	159·97 (0·59)	145·89 (0·59)	186·07 (0·70)
Sahibabad .	137·88 (0·42)	125·72 (0·44)	166·69 (0·65)	210·80 (0·71)
Sanganer .	106·25 (0·56)	96·35 (0·49)	106·35 (0·66)	87·92 (0·68)

Note: Figures in parenthesis are the average expenditure per '000' kCal per year.

2.7 Cost of providing energy

In a free economy, energy prices are determined by market forces. In India, the commercial energy sector (coal, oil, electricity) is almost entirely owned by the government which has a pervasive role in production, distribution and pricing of energy. The prices of energy are

determined by government at all stages of production and distribution, and are administered prices. As regards firewood, although government owns most of the forest resources, the distribution of firewood is mainly in the hands of private agencies. Besides, transport and marketing of firewood is also largely in the hands of the private sector. Therefore, prices of firewood are largely determined by market forces.

Administered prices of energy have been set with the objective of providing energy for 'basic needs' to the poor at prices they can afford. Whether the government's objective has been met by artificially administering energy prices is open to debate. However, it should be noted again that our survey indicates that poor people are paying a higher price for one unit of useful energy.

2.8 Cost of providing energy at shadow prices

In the earlier section, the cost of energy has been calculated at market price i.e., at prices faced by consumers. In this section we present an analysis of costs of providing energy at shadow prices (Table 2.14) i.e., at economic costs considering the viewpoint of society rather than that of the individual consumer. For example, the shadow price for imported kerosene would be equal to the c.i.f. price of importing kerosene, adjusted for the premium on foreign exchange (a premium of 25% is generally taken to reflect scarcity of foreign exchange) and real resource costs of transporting and storing kerosene. It may be noted that the real costs of providing energy are much higher than the costs at market prices, particularly for high income groups in Delhi and Madras. At shadow price (even at market prices), the least cost alternative is LPG, followed by kerosene and soft coke. This shows, that if supply constraints are removed for LPG the economic cost of providing energy would go down. However, lower income groups will not opt for this more efficient alternative due to shortage of finances for high initial costs of equipment.

TABLE 2.14

Per capita cost of providing energy per year at shadow prices (in Rupees)

City	Income group			
	I	II	III	IV
Delhi . .	263·99 (0·86)	248·92 (0·86)	266·95 (0·90)	192·61 (1·10)
Madras .	299·12 (0·85)	260·49 (0·90)	249·47 (0·92)	231·94 (1·02)
Jaipur .	223·14 (0·91)	228·49 (0·86)	214·31 (0·91)	272·66 (1·16)
Jabalpur .	232·12 (0·90)	300·89 (1·12)	280·09 (1·14)	391·02 (1·48)
Sahibabad .	291·74 (0·89)	258·25 (0·89)	246·54 (0·96)	301·42 (1·02)
Sanganer .	235·51 (1·24)	228·41 (1·17)	233·25 (1·44)	203·25 (1·57)

Note : Figures in parenthesis are the average cost of providing energy per '000 kCal per year.

Table 2.15 given below indicates the difference between market price and shadow price of each fuel. It also summarizes the difference in the two costs in terms of useful energy provided by various fuels.

TABLE 2.15

Estimated useful energy and cost of major domestic fuels

Fuel	Unit	Gross energy (kilocalories per unit)	Efficiency of equipment%	Useful energy (kilocalories per unit)	Market price (Rs./unit)	Shadow price (Rs./unit)	Market price (Rs./'000 useful kCal)	Shadow price (Rs./'000 useful kCal)
LPG . . .	kg.	11750	60	7050·0	4·06	6·00	0·58	0·85
Kerosene . .	lts.	8547	40	3418·8	2·25	4·50	0·66	1·82
Soft coke. . .	kg.	5770	20	1154·0	0·90	1·80	0·78	1·56
Firewood . . .	kg.	4750	10	475·0	1·20	1·20	2·53	2·53

Source : Sharma and Bhatia (1986).

Advisory Board on Energy (1985).

2.9 Policy alternatives

The main points that emerge from the foregoing analysis are :—

1. The fuel-mix chosen by a household depends on a variety of factors such as income, convenience, cost of equipment (appliances such as stoves, cylinders), adequacy and reliability of supply and prices of alternative fuels.
2. At current market prices, expenditure on energy is higher in the lower income groups. At shadow prices, cost of providing energy too is higher in the lower income groups.
3. From the economy's point of view and taking into account efficiency of conversion, LPG is the least cost alternative, followed by kerosene and soft coke and firewood the most expensive.

Others aspects that should be considered while evaluating various policy measures are :—

1. LPG is the cheapest fuel from the economy's point of view and currently it is not being imported. In case its use is promoted, its production level will have to be enhanced. The output of LPG can be increased either by extracting the relevant fractions from natural gas or by producing more LPG in refineries by reducing the output of naphtha and/or fuel oil. When it is produced from natural gas, its production would result in lower availability of natural gas for fertilizer production which in turn would lead to a diversion of naphtha from exports (India exported 1.8 million tonnes of naphtha at Rs. 4485.2 million in 1985/86)*.
2. Even while the use of LPG is promoted, it is likely that lower income groups would not benefit due to high initial cost in acquiring an LPG stove and a cylinder. At current price, this would mean an expenditure of Rs. 1500. Unless the government provides soft loans for purchase of such energy-efficient equipment, poor people would not be in a position to incur such high capital costs.
3. Comparing two competing fuels kerosene and soft coke, the former is a more convenient fuel to use and it is also cheaper (both at the market or shadow price). However, kerosene is an imported fuel. (India imported 2.6 million tonnes of kerosene at a total cost of Rs. 8444.1 million in 1985/86.).

On the other hand the use of soft coke is limited because of—

(i) consumers prefernce for convenient fuels like kerosene and LPG,

(ii) relatively high cost of soft coke as compared to kerosene, and

(iii) inadequate supplies of soft coke.

4. With a view to the large scale unemployment and under-employment of labour in coal producing States (Bihar, M.P., Orissa) the use of soft coke should be promoted. From the economy's point of view, the shadow wage rate of 0.4 to 0.5 should be discounted from the actual cost of producing, storing and transporting soft coke. Also, soft coke can now be used conveniently in domestic uses by converting it into briquettes. The economics and relative advantage of providing subsidy on kerosene or soft coke appear favourable.

The above analysis provides some important pointers to policy formulation. It has emerged from earlier sections that various factors determining the pattern of demand are the availability of fuel, the income of a household and the relative cost of a fuel. Which alternative applies—how the balance between them might change in future is of major importance to the pace and timing of the energy transition and to energy policy formulation. Variation in per capita energy consumption over the various sizes of cities was observed but it was felt that energy use was probably not a function of urban size itself but of household incomes, the priorities given to fuel distribution and economics of supply.

2.10 Future Energy Scenarios

The total urban population in India has increased from 109.1 million in 1971 to 159.73 million in 1981. In the Seventh Five Year Plan, it is envisaged that the total population of India would increase from 685.2 million in 1981 to 837.2 million in 1991 end to 986.1 million in 2001. Further, it is expected that the share of urban population in 2001 would be 33 per cent of the total. In Table 2.3.1, total and urban population and the distribution of population in class I, II and III cities are presented. These classes of cities have been defined on the basis of their population :—

1. Class I cities — with a population of over one lakh
2. Class II cities — with a population of between 20001 to 99999
3. Class III cities — with a population less than or equal to 20000

* In 1986-87, the net production of natural gas (on shore and off shore) was, 12030 mn. cubic metres. Of this, 30 per cent was flared and 1 per cent re-injected. Thus net production was 8315 mn. cubic metres and 40 per cent of this was used in the fertilizer industry and 15.6 per cent was consumed for captive use and LPG shrinkage. The other uses of natural gas are in power generation as an industrial fuel, in tea plantations etc.

On the basis of the past trend, we have projected the population distribution in these three classes of cities.

In the earlier sections, the quantity and type of energy consumed in the household sector was found to be influenced by the (i) availability of fuel; (ii) income of the family; and (iii) prices of the fuels.

In order to project quantities of fuels as well as patterns of energy mix that would evolve in the future, it is necessary to make certain assumptions about the population distribution in urban areas as well as other variables. Firstly, we have assumed that relative prices of fuels would not change over time and also that they would remain the same in real terms. Similarly, as regards income distribution of the population we have made specific assumptions about change except in an indirect way by assuming certain changes in the pattern of consumption and supply of different fuels, which naturally would be influenced by income changes and other social factors that would come into play. From this study and the analysis presented earlier it has become clear that not only is the social cost of providing traditional forms of energy, viz. fuelwood and cowdung etc. very high imposing very heavy social costs on the country, but the efficiency of appliances and end-use technologies is far superior for some of the higher grade fuels, such as LPG and other commercial fuels in preference to the so-called non-commercial fuels. Based on projections of population and demand for energy for the domestic sector, we have evaluated options to bring about a shift in favour of larger use of commercial fuels. The scenarios that we have presented can be characterised as follows :—

1. For Scenario I

(a) Average consumption level for each fuel in each class of city has been derived by taking weighted average for the two cities covered in that particular class in our sample. For example, per capita LPG consumption in class I cities is equivalent to—

$$\frac{\text{Total LPG consumption in Delhi+Madras}}{\text{Total population in Delhi+Madras}}$$

(b) The fuel mix in class I, II and III remains the same as in 1987.

2. Scenario II

(a) In Class I — 95% of non-electrical energy is obtained from LPG and the balance 5% from kerosene.

— An increase of 25% in electricity demand over consumption level in Scenario I.

(b) In class II — An increase of 30% consumption in LPG over the consumption level in Scenario I and the balance of the non-electrical energy is derived from kerosene.

— An increase of 20% in electricity demand over Scenario I.

(c) In class III — An increase of 20% consumption in LPG over the consumption level in Scenario I and the balance non-electrical energy is derived from kerosene.

— An increase of 15% in electricity demand over Scenario I.

3. Scenario III

(a) Consumption level of LPG and electricity in class I, II and III is the same as in Scenario II, and the balance non-electrical energy demand is assumed to be supplied by soft coke.

Basically, the criterion for structuring these three scenarios is that :—

(a) In Scenario I, it has been assumed that the fuel-mix for non-electrical energy is the same in 2001 as exists in 1987.

(b) In scenario II, it has been assumed that an increase in LPG consumption level would be due to relatively better availability of this fuel and higher income levels. From 1980-85, the LPG consumption increased by 25 per cent annually. We have tried to keep this overall growth rate constant and have assumed higher growth rate in class II and relatively lower growth rate in class III cities. while in class I, LPG already meets 87 per cent of non-electrical energy requirement, it is assumed a stabilize at 95% by 2001 A.D. The other underlying assumption was on unconstrained kerosene supply. This would have to be achieved by importing more of this fuel, if necessary.

(c) In scenario III, supply of soft coke was assumed to be unconstrained. And, further it was assumed that with a favourable price structure and in a convenient form to use, (say as briquettes), soft coke is the preferred fuel, after LPG.

TABLE 2.16

Projected population, urban population in Class I, II and III cities

	1971	1981	1991	2001
Population (in million)	548·16	685·2	837·2	986·1
Urban Population (in million) % age of the total population	109·11	159·73	230·0	326·0
Population in				
(1) Class I cities	61·10	95·84	147·2	218·4
(population > 1 lakh)	(51·0)	(60·0)	(64)	(64)
(2) Class II cities	29·46	41·53	57·5	78·2
(population ranging between 20001—19999)	(27)	(21)	(25)	(24)
(3) Class III cities	18·55	22·36	25·3	29·3
(population < 20000)	(17·0)	(14)	(11·0)	(9)

Source : Seventh Five Year Plan and CMIE's report : Basic statistics relating to the Indian Economy.

Scenario I

TABLE 2.17

Estimates for energy requirement in the urban household sector, in the year 2000 AD

City class	Per capita consumption of energy		Total population (in million)	Percentage share of				Total Requirement of				
	Non-Electrical '000' kCal (useful)	Electrical kWh		LPG	Kerosene	Soft Coke	Others	LPG	Kerosene (10'	Soft Coke useful kCal)	Others	Electricity (10' kWh)
I	325	475	218·4	87·5	10·5	0·5	1·5	62107·5 (809·6)	7452·9 (1725·2)	354·9 (387·5)	1064·7	103740
II	300	290	78·2	68·3	16·2	3·7	11·8	16023·18 (2272·8)	3800·52 (879·7)	868·02 (752·2)	2768·28	22878
III	250	215	29·3	50·5	27·4	4·6	17·5	3699·1 (524·7)	2007·1 (464·6)	337·0 (292·0)	1281·9	6299·5
						TOTAL		81829·8 (11607·1)	13260·52 (3069·5)	1553·92 (1411·7)	5114·88	132717·5

(Figures in parenthesis indicate gross energy in '000' tonnes).

Scenario II

TABLE 2.18

Estimates for energy requirement in the urban household sector, in the year 2000 AD

City class	Per capita consumption of energy		Percentage share of		Total Requirement of		
	Non-Electrical ('000 useful kCal)	Electrical (kWh)	LPG	Kerosene	LPG	Kerosene (10^9 useful kCal)	Electricity (10^6 kWh)
I	325	595	95	5	67431	3549 [9464·7]	129948 [821·5]
II	300	348	89	11	20879·4	2580·6 [2961·6]	27213·6 [597·4]
III	250	250	61	39	4468·25	2856·8 [633·8]	7325·0 [661·3]
			TOTAL		92778·7 [13160·1]	8986·4 [2080·2]	164486·6

Note : Figures in paranthesis indicate gross energy in '000 tonnes.

Scenario III

TABLE 2.19

Estimates for energy requirement in the urban household sector, in the year 2000 AD

City class	Per capita consumption of energy		Percentage share of		Total Requirement of		
	Non-Electrical ('000 useful kCal)	Electrical (kWh)	LPG	Kerosene	LPG	Kerosene	Electricity
					(10^9 useful kCal)		(10^6 kWh)
I	325	595	95	5	67431 [9464·7]	3549 [3075·4]	129948
II	300	348	89	11	20879·4 [2961·6]	2580·6 [2236·2]	27213·6
III	250	250	61	39	4468·25 [633·8]	2856·8 [2475·6]	7325
			TOTAL		92778·7 [13160·1]	8986·4 [7787·2]	164486·6

Note : Figures in parenthesis indicate gross energy in '000 tonnes.

TABLE 2.20

Consumption of commercial fuels in urban areas in 1985 and 2000 A.D.

(Unit : '000' tonnes, gross)

Fuels	1985	2000 A.D.			Annual Growth Rate (in %) (1985-2000)	
		Scenario I	Scenario II	Scenario III	Scenario I	Scenario II & III
LPG	1028·9 (assuming that of the total residential consumption 95% in urban areas)	11607·1	13160·1	13160·1	17·5	18·5
Kerosene	1240 (Of the total residential consumption 20% in urban areas)	3069·5	2080·2	..	6·23	3·5
Soft Coke	1832 (Of the total residential consumption 80% in urban areas)	1411·7	..	7787·2	—1·72	10·13
Electricity (in 10^6 kWh)	26383 (of the total residential consumption 90% in urban areas)	132717·5	164486·6	164486·6	11·37	12·30

Source : Energy Indicators of Major Developing Member Countries of ADB, August, 1987.

TABLE 2.21

Comparison of estimates for Soenarios I, II and III against official estimates for year 1999-2000

Fuel	Unit	Estimates for urban household energy requirement			Estimates for total households energy requirement by	
		Soenario I	Soenario II	Soenario III	Energy Demand Screening Group	
Commercial Fuel						
1. LPG & Kerosene	mn. tonnes	14·71	15·3	13·2	17·27	
2. Soft Coke	mn. tonnes	1·4	..	7·8	14·00	
3. Electricity	Bkwh	132·7	164·5	164·5	82·62	
Non-Commercial Fuel						
1. Firewood	mn. tonnes	107	..	..	188·3	(52·3)
2. Cowdung	mn. tonnes	..	..	..	150·53	(18·36)
3. Crop residue	mn. tonnes	..	..	..	61·60	(4·20)

Note : Figures in parenthesis are the estimates for urban areas.

Table 2.21 indicates that there is not much difference in the estimated demand for LPG and kerosene, in the year 2000 A.D., as estimated by the Energy Demand Screening Group (EDSG) and by us. However, our projected demand for electricity is almost double that estimated by the EDSG and that of soft coke about half. The EDSG does not provide separate estimates for rural and urban energy demand and the high soft coke projection is based on the assumption of higher consumption and supply of soft coke in the future, which appears highly over-optimistic. But, we feel that electricity demand has been grossly underestimated by EDSG. EDSG's demand for electricity indicate an annual growth rate of 7.2 per cent from 1985 to 2000 while during the period 1980-85, electricity consumed in the residential sector had increased 25 per cent, annually. Some broad policy directions emerging from this analysis, as they apply to the household sector, are presented later.

CHAPTER 3

TRANSPORT SECTOR

3.1 General

The pattern of transportation in our cities (urban centres) is different from one another and is generally based on a multimodal system. This multimodal system consists of motorised (such as buses, cars, motorcycles, etc.) as well as non-motorised (such as cycles, cycle-rickshaws, etc.) modes. The mass transit rail system also exists in some of our cities. With increasing urbanisation and growth of our cities, the transport demand is increasing and is characterised by increasing trip lengths and traffic densities. The pattern of transportation in our cities is also characterised by increasing usage of motorised modes. However, the extent of usage of motorised modes and their mix differs and is generally dependant on the factors such as topography and the network structure, among others. All these factors have an impact on the quantum of commercial energy consumption by the urban transportation systems.

This part of the study deals with the assessment of commercial energy consumed by urban transportation systems in different urban sizes. The analysis, however, is based on the available secondary information and past studies.

3.2 Transportation Pattern

3.2.1 Transportation pattern between cities

The effect of increasing urbanisation is observed more in the metropolitan cities of our country. The population of these cities is increasing at an alarming rate. Table 3.1 gives the population values in some of the cities during the past few decades. The natural growth of population of our cities, coupled with large waves of migration from rural areas, in the absence of (or limited) employment opportunities, educational and other facilities, necessitates the expansion of the cities. This causes spatial separation of activities resulting in the increasing travel distances and usage of various modes.

TABLE 3.1

Population Growth in Some of the Cities

CITY	YEAR				Annual compound growth rate
	1951	1961	1971	1981	
1	2	3	4	5	6
Trivandrum	N.A.	N.A.	4·10	4·83	1·65
Cochin .	N.A.	N.A.	3·28	5·13	4·57
Calicut .	N.A.	N.A.	3·34	5·46	5·04
Jaipur .	2·91	4·03	6·15	9·77	4·12
Pune .	5·60	6·96	9·99	13·70	3·03
Delhi .	14·37	23·59	36·47	54·54	4·70
Greater Bombay .	29·67	41·52	59·71	82·27	3·50
Madras .	15·42	19·44	31·70	42·76	3·50
Bangalore .	8·11	12·00	16·54	29·14	4·36
Calcutta .	45·88	57·36	70·31	91·65	2·30

Note : Population figures are in lakhs.

Source : References 5–8, 10, 18, 31–33.

The per capita person trips (excluding walk) exhibit large variations among large and medium sized cities as shown in Table 3.2. This reveals that as the city size increases the per capita person trips also increases. This increasing phenomenon perhaps, could be attributed to the increasing facilities available for employment and education in larger cities in comparison to the smaller ones. No pattern seems to exist in the extent of usage of individual transport modes with respect to the population sizes of cities, (Tables 3.3 and 3.4). For instance, in Delhi there are about 39,000 person trips by auto-rickshaws and taxis together whereas in Greater Bombay nearly 7,70,000 person trips are performed by taxis alone. Which means in Delhi only 1.00 per cent of the person trips are performed by hired fast modes while in Greater Bombay over 10.00 per cent of the person trips are performed by the same modes. Even though, Pune has almost the same number of person trips (40,971) as that of Delhi, it's share of the total number of person trips by hired fast modes is 5.36 per cent which is substantially higher than that of Delhi with 1.00 per cent of such trips. Trivandrum, Cochin and Calicut have a higher percentage of person trips performed by hired fast modes in comparison to Delhi although the number of such trips are negligible in those cities, with the highest being 5,908 in Calicut.

TABLE 3.2

Percentage person trip-rates per day in different cities

CITY	YEAR	Population (lakhs)	Person trips (lakhs)	Per capita trip rate
Trivandrum	1977	4·53	1·60	0·353
Cochin .	1978	4·85	1·81	0·373
Calicut .	1980	5·40	2·01	0·373
Jaipur .	1985	9·99	5·82	0·583
Pune .	1978	11·80	7·64	0·648
Delhi .	1981	54·00	39·00	0·722
Greater Bombay .	1979	79·00	75·75	0·959

Source : References 5–14, 18, 19.

TABLE 3.3

Modewise person trips per day in different cities

City / Year	Trivandrum 1977	Cochin 1978	Calicut 1980	Jaipur 1985	Pune 1978	Delhi 1981	Greater Bomby 1979
Cycle	31,904	24,548	21,538	3,32,619	3,52,000	6,63,000	..
Bus	96,215	1,26,926	1,52,184	35,532	1,67,171	23,29,000	29,17,000
Car	20,521	10,589	11,613	12,831	36,920	2,16,000	5,06,645
Scooter/Motorcycle	8,659	5,258	6,788	1,83,582	1,37,513	4,32,000	47,530
Auto-rickshaw	409	2,481	5,756	2,221	40,971	30,000	..
Taxi	2,130	155	152	..	..	9,000	7,70,000
Train	..	262	295	..	17,275	61,000	32,90,000
Others	23	10,548	2,973	15,545	12,356	1,60,000	49,970
TOTAL	1,59,861	1,80,767	2,01,299	5,82,330	7,64,386	39,00,000	75,81,145

Source : References 5–14, 18, 19.

TABLE 3.4

Percentage Modal split in different cities

City / Year	Trivandrum 1977	Cochin 1978	Calicut 1980	Jaipur 1985	Pune 1978	Delhi 1981	Greater Bombay 1979
Cycle	19·96	13·58	10·70	57·12	46·05	17·00	..
Bus	60·19	70·22	75·60	6·10	21·87	59·74	38·48
Car	12·84	5·86	5·77	2·20	4·83	5·53	6·68
Scooter/Motorcycle	5·42	2·91	3·37	31·53	17·99	11·07	0·63
Auto-rickshaw	0·25	1·37	2·86	0·38	5·36	0·77	..
Taxi	1·33	0·08	0·08	..	..	0·23	10·15
Train	..	0·14	0·14	..	2·26	1·56	43·40
Others	0·01	5·84	1·48	2·67	1·64	4·10	0·66
TOTAL	100·00	100·00	100·00	100·00	100·00	100·00	100·00

Source : References 5—14, 18, 19.

The number of person trips performed by buses in Jaipur are only 35,532 which is about one-third of similar trips (96,215) in Trivandrum, although the population of Jaipur is over twice that of Trivandrum. Again the percentage share of person trips performed by buses, both in Pune and Delhi are less than those of Trivandrum, Cochin and Calicut although their number is much higher.

The number of person trips performed by cars generally increases with the increase in the size of the city with the exception of Trivandrum which has 20,521 car person trips resulting in a higher number of car trips than Jaipur with only 12,831 car person trips. The lowest and highest percentage share of car person trips are in Jaipur and Trivandrum respectively, while in the other cities it ranges between 4.83 and 6.60. Delhi has about 4,32,000 person trips by scooters/motorcycles although it's percentage share of total person trips is only 11.07 while Jaipur with it's 1,83,582 person trips by the same mode has the higher percentage share (31.53 per cent) of such trips among the cities.

However, the modal split in our cities seems to be dependant on the extent of services catered by the mass transport systems. For instance, the percentage share of person trips performed by personalised modes—cycles, scooters/motorcycles and cars—decrease with the increase in the share of person trips by mass transport systems. The percentage share of person trips being performed by cycles have a similar trend, but the same is not true of cars and scooters/motorcycles individually.

The mass transport supply in our cities does not show a definite pattern with respect to the population size of a city, Table 3.5. However, the mass transport supply does influence the development of intermediate public transport (IPT)

modes. A city with a deficiency of one mode is normally well-supplied by some other mode.

The development of mass transport systems in many of the cities is hindered by the narrow road networks, further narrowed by encroachments. This is especially true in many of our medium sized cities and also in some parts—old parts—of the large cities. The development of the types of mass transport—rail or bus—is perhaps dependant on the structure of the city. For instance, Delhi with it's circular structure is mainly dependant on bus based mass transport services whereas Greater Bombay has both the systems with rail based system having slightly higher share of mass transport services. This, however, does not imply that one form of city structure is better than the other, for a city like Delhi with it's circular structure may have shorter trip lengths compared to that of a linearly structured city like Greater Bombay.

3.2.2 Transportation pattern within cities

The pattern of transportation within a city has changed over the years. Such changes are not easily descernible for the comprehensive transportation studies have been carried out for only a few cities, and much less has the same has been repeated for the same city.

Table 3.6 presents the change in the pattern of transportation within Bombay Metropolitan Region (BMR). This clearly indicates that the per capita trip rate is increasing and the number of person trips have increased from 47.21 lakhs in 1968 to 93.90 lakhs in 1979. The share of mass transportation person trips has increased from 79.58 per cent in 1968 to 83.96 per cent in 1979 while the shares of person trips by cars and taxis have decreased inspite of the fact that their number has increased. Similar trends could be expected to exist in Greater Bombay as almost over 78 per cent of mass transportation trips, over 96 per cent of car trips and all of taxi trips are performed in it's jurisdiction.

The estimates of the person trips in Greater Bombay for the year 2001, Table 3.7 indicate that they are likely to be doubled compared to the base year (1979) figures. The number of person trips by all modes are likely to be doubled except in the case of trips by taxis which are likely to increase to 10.52 lakhs in 2001 from 7.70 lakhs in 1979. The percentage share of these trips is likely to decrease.

TABLE 3.5

Provision of public transport in different cities, 1977

City	Population (millions)	Conventional buses per 100,000 pop.	Auto-rickshaws per 100,000 pop.	Cycle-rickshaws per 100,000 pop.
Calcutta	7·96	n.a.	..	339*
Bombay	7·54	22·1	..	..
Delhi	4·83	47·5	352	107
Madras	3·10	46·9	43	178
Hyderabad	2·27	25·7	260	620
Bangalore	2·08	31·1	446	20
Ahmedabad	1·95	29·8	336	110
Kanpur	1·51	3·3	Neg	3000
Pune	1·08	32·3	429	neg
Nagpur	1·05	12·1	51	570
Lucknow	0·94	12·3	neg	2340
Jaipur	0·81	9·2	217	1050
Agra	0·73	16·8	7	2470
Baroda	0·63	22·0	378	neg
Trivandrum	0·58	42·6	56	100
Vishakapatnam	0·52	23·9	47	800
Chandigarh	0·50	21·1	252	400
Vijayawada	0·44	21·0	47	800
Guntur	0·44	14·0	25	900
Kolhapur	0·32	17·0	365	neg
Warangal	0·25	23·3	20	800
Aurangabad	0·23	19·3	202	neg

* Mainly hand-rickshaws.

Source : Reference 20.

TABLE 3.6

Changing pattern of transportation in Bombay Metropolitan Region (BMR)

Mode	1968			1979		
	Person Trips (in lakhs)	Per cent	Per Capita Trip Rate	Person Trips (in lakhs)	Per cent	Per Capita Trip Rate
Bus	19·11	40·48	0·341	39·72	42·30	0·378
Rail	18·46	39·10	0·329	39·12	41·66	0·372
Car	5·00	10·59	0·089	5·18	5·52	0·049
Taxi	4·41	9·34	0·079	7·70	8·20	0·073
Private mode other than car	0·23	0,49	0·004	2·18	2·32	0·021
TOTAL	47·21	100·00	0·842	93·90	100·00	0·893

TABLE 3.7

Comparison of 1979 and 2001 transportation patterns in Greater Bombay

Mode	1979		2001	
	Person Trips (in lakhs)	Per cent	Person Trips (in lakhs)	Per cent
Car	5·07	6·60	10·52	6·84
Taxi	7·70	10·17	10·26	6·67
Rail	32·90	43·43	68·89	44·81
Bus	29·17	38·51	61·08	39·73
Scooter/Motorcycle	0·47	0·63	1·46	0·95
Other	0·50	0·66	1·54	1·00
TOTAL	75·81	100·00	153·75	100·00

Source : References 11, 12, 18, 19.

The number of person trips (excluding walk) in Delhi have increased from 11.31 lakhs in 1957 to 39.00 lakhs in 1981, (Table 3.8). The number of trips performed by different modes and the modal split are presented in Table 3.9. The number of person trips by all modes have generally increased with the exception of hired fast modes (autorickshaws and taxis). The number of car trips in 1981 are higher than those in 1957, although, they are marginally lower than those in 1969. This can perhaps be attributed to the general shift prevailing from cars to two wheelers since a few years ago. This is emphasized by the fact that the number of

TABLE 3.8

Intra urban travel trends in Delhi

Year	Person Trips@	Per Capita Trip
	(in lakhs)	Rate
1957	11·31$	0·584
1969	15·60	0·466
1981	39·00	0·722

@ Excluding walk trips.
$ Includes inter city trips.
Source : References 13, 14, 15.

TABLE 3.9

Changing pattern of transportation in Delhi

Mode	1957		1969		1981	
	Person Trips (lakhs)	Per cent	Person Trips (lakhs)	Per cent	Person Trips (lakhs)	Per cent
Cycle	4·07	36·00	4·37	28·01	6·63	17·00
Bus	2·53	22·40	6·17	39·57	23·29	59·74
Car	1·14	10·10	2·43	15·54	2·16	5·53
Scooter/Motorcycle	0·11	1·00	1·31	8·42	4·32	11·07
Autorickshaw	0·88	7·80	0·61	3·88	0·30	0·77
Taxi	0·50	4·40	0·18	1·16	0·09	0·23
Rail	0·05	0·40	0·91	1·23	0·61	1·56
Others	2·03	17·90	0·34	2·19	1·60	4·10
TOTAL	11·31	100·00	15·60	100·00	39·00	100·00

Source : References 13—15.

trips by scooters/motor cycles have increased from 0.11 lakhs in 1957 to 1.31 lakhs in 1969 and then to 4.32 lakhs in 1981.

The estimates of the person trips in future for Pune, Table 3.10, indicate that they are likely to increase in number for all the modes. An interesting feature of the future estimates of Pune City is the declining share of mass transportation trips. The share of trips by other modes is also likely to decrease except in the case of scooter/motor cycles which is likely to increase substantially. In fact, the likely increase in the share of scooters/motor cycle trips is the sum of the likely declining shares of all the other modes.

TABLE 3.10

Comparison of present and future estimates of person trips in Pune city

Mode	1979		1986		1991		2001	
	Person trips (000's)	Per cent	Person trips (000's)	Percent	Person trips (000's)	Per cent	Person trips (000's)	Per cent
Cycle	352·00	46·05	476·10	40·94	585·65	40·44	695·20	37·40
Bus	167·17	21·87	244·80	21·05	291·69	20·14	361.13	19·42
Car	36·92	4·83	58·11	5·00	71·21	4·92	87·95	4·73
Scooter/Motorcycle	137·51	17·99	260·25	22·38	348·51	24·07	522·77	28·12
Autorickshaw	40·97	5·36	79·96	6·87	98·70	6·82	127·27	6. 85
Rail	17·28	2·26	24·71	2·12	28·49	1·97	34·19	1·84
Others	12·54	1·64	19·07	1·64	23·75	1·64	30·49	1·64
TOTAL	764·39	100·00	1163·00	100·00	1448·00	100·00	1859·00	100·00

Source : Reference 10.

3.3 Energy Consumption Patterns

The types of energy consumed by the transport sector in our cities could be classified in two groups, viz., commercial and non-commercial. As has been indicated earlier urban transportation systems in our cities are based on multi-modal systems, and hence they are expected to consume both commercial and non-commercial energy forms. Commercial energy forms which are in general use of the urban transportation systems in our cities are petrol, high speed diesel and electricity; and these are used by modes like cars, scooters/motor cycles and trains. Urban transport modes like cycle rickshaws, horse drawn carts etc., consume non-commercial energy in the form of human or animal energy. This report, however, deals with the pattern of commercial energy consumption by the urban transportation systems in our cities.

The quantum of commercial energy consumed depends on the total vehicular kilometers, occupancy levels of various modes and the fuel consumption rate say per vehicular kilometer. Tables 3.11 and 3.12 give the average trip lengths and occupancy levels considered for estimating the quantum of commercial energy consumed. The fuel consumption rates adopted for this study are given in Table 3.13.

TABLE 3.11

Modewise trip lengths (in kms) in different cities

City	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Year	1977	1978	1980	1985	1978	1981	1979
Bus	5·04	4·89	6·37	5·24	6·68	8·60	16·50
Car	4·47	3·47	4·20	5·22	4·51	8·10	12·00
Scooter/Motor cycle	4·42	4·48	4·51	4·70	4·58	7·32	5·00
Autorickshaw	3·31	3·08	2·91	4·81	2·86	4·40	—
Taxi	4·38	8·60	5·54	..	..	4·40	4·50

Source : References 5—14, 18, 19.

TABLE 3.12

Modewise occupancy levels in different cities (no. of persons/vehicles)

City	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Year	1977	1978	1980	1985	1978	1981	1979
Bus	30·00	30·00	30·00	30·00	60·00	66·00	77·00
Car	1·60	1·79	2·23	2·00	2·00	2·00	1·57
Scooter/Motor cycle	1·18	1·30	1·15	1·50	1·50	1·25	1·10
Autorickshaw	2·95	1·49	1·54	1·50	1·75	1·75	..
Taxi	1·86	1·44	3·35	..	..	2·5	1·4

Source : References 5—9, 11, 12, 18, 19.

TABLE 3.13

Fuel consumption rates of different modes

Mode	Fuel type	Consumption rate (kms/litre)
Cars	Petrol	10·58
Scooters/Motorcycles	Petrol	29·29
Taxi	Petrol	8·62
Autorickshaw	Petrol	17·01
Bus	HSD	3·50

Source : Reference 17.

The energy consumption pattern in the cities was estimated on the basis of the transportation demand in the year 1986. The population estimates for the year 1986 are given in Table 3.14. The per capita trips and the modal split in the cities was assumed to remain the same in 1986 as that of the corresponding base years, and the transportation demand was estimated accordingly, (Table 3.15). The transportation demand in 1986 for Pune city is, however, based on the projections given in the specific study report.

TABLE 3.14

Population estimates in different cities, 1986

City	Population (in lakhs)
Trivandrum	5·24
Cochin	5·65
Calicut	5·78
Jaipur	10·05
Pune	15·74
Delhi	67·97
Bombay	90·79

TABLE 3.15

Modewise person trips (000's) in different cities (1986)

City / Mode	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Bicycle	36·93	28·65	23·00	334·72	476·10	834·19	..
Bus	111·35	148·16	162·54	35·75	244·40	2931·44	3350·45
Car	23·75	12·37	12·41	12·89	58·11	271·36	581·63
Scooter/Motor cycle	10·03	6·14	7·25	184·76	260·25	543·20	54·85
Autorickshaw	0·46	2·89	6·15	2·23	79·96	37·78	..
Taxi	2·46	0·17	0·17	..	..	11·29	883·76
Train	..	0·30	0·30	..	24·71	76·55	3778·84
Others	0·02	12·32	3·18	15·65	19·07	201·19	57·47
TOTAL	185·00	211·00	215·00	576·00	1163·00	4907·00	8707·00

The pattern of fuel consumption per day in different cities for the transportation demand estimates of 1986 are given in Tables 3.16 and 3.17. The quantum of fuel consumed by each mode in general is not dependant on the population size of the city but on the pattern of transportation. In other words, in a city with higher number of trips by a particular mode, the aggregate fuel consumption of that mode is also higher. The aggregate fuel consumption, irrespective of the mode is also higher in the cities with higher number of person trips by modes utilising this type of fuel. Trivandrum, Cochin and Calicut can be considered to belong to the same size class of cities as their population sizes are marginally different. In this respect, if the aggregate energy consumption (including both petrol and high speed diesel) in terms of T O E per day is considered the energy consumption is higher in larger cities than in smaller ones.

TABLE 3.16.

Modewise fuel consumption (in litres) per day in different cities (1986)

City Mode	Fuel type	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
1. Bus	HSD	5,345	6,900	9,861	1,785	7,787	1,35,373	2,05,128
2. Car	Petrol	6,272	2,267	2,209	3,180	12,385	1,03,876	4,20,186
3. Scooter/Motorcycle	Petrol	1,283	722	971	19,765	27,130	1,08,603	8,512
4. Autorickshaw	Petrol	30	351	683	420	7,682	5,584	..
5. Taxi	Petrol	672	118	33	..	..	2,305	3,29,543
TOTAL (2 + 3 + 4 + 5)		8,257	3,458	3,896	23,365	47,197	2,20,368	7,58,241

TABLE 3.17

Energy Consumption (in tonnes of oil equivalent) per day in different cities (1986)

Fuel Type	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
HSD	4·51	5·81	8·31	1·50	6·56	114·10	172·88
Petrol	6·14	2·57	2·90	17·39	35·12	163·98	564·24
TOTAL	10·65	8·38	11·21	18·89	41·68	278·08	737. 12

The pattern of petrol consumption in the three cities of Trivandrum, Cochin and Calicut imply that it is definitely dependant on the pattern of transportation. For instance, Trivandrum with the least number of person trips and being the smallest of the three cities, has the highest petrol consumption of 8,257 litres per day while Cochin's consumption of the same fuel is 3,458 litres per day.

The total energy consumption by the urban transportation systems in the cities as presented in Tables 3.16 and 3.17 exclude the energy consumed by trains and other forms of transport existing in a particular city. Greater Bombay has the highest person trips (37.79 lakhs) by trains followed by Delhi (0.77 lakhs) and Pune (0.25 lakhs) and; the rest has negligible (or nil) number of such trips. Trip lengths of such trips are not available except for Greater Bombay, where it is about 20.00 kms. The energy consumption in Greater Bombay of such trips is the order of about 20,406 lakh BTU's per day with the assumption that operating energy intensity (propulsion energy) is about 27 BTU's per passenger kilometer by suburban electric train. In Cochin about 56.81 per cent (i.e. nearly 7,000 trips in 1986) of the trips by other modes are performed by motor boats.

The trends in the energy consumption for a particular city over the years could be examined for only one city, i.e., Delhi. Trip lengths considered for estimating the energy consumption in three different years, for Delhi are presented in Table 3.18. The quantum of energy consumed per day in three different years in Delhi are given in Tables 3.19 and 3.20. The energy consumption in Delhi has increased from 47.48 T O E in 1957 to 221.24 T O E in 1981. This increasing energy consumption phenomenon could be observed in both the types of fuel—petrol and high speed diesel—and in all modes of transport except in the case of hired fast modes. Incidentally the number of trips by such modes have decreased over the years. The increase in the energy consumption in Delhi is not only due to the increase in the number of trips by modes using commercial energy, but also due to the increasing trip lengths of such modes, which is the impact of the expanding city with the rise in population. This is emphasized by the fact the number of person trips by cars though lower in 1981 than they were in 1969, the petrol consumption has increased from 0.59 lakh litres per day to .83 lakh litres.

TABLE 3.18

Trip length (in kms) in Delhi

Mode/Year	1957	1969	1981
Cycle	5·00	4·77	3·80
Scooter/Motorcycle	4·50	5·62	7·32
Car	4·00	5·10	8·10
Bus	5·00	6·64	8·60
Taxi	5·00	4·81	4·40
Autorickshaw	5·00	4·81	4·40

Source : References 13—15.

TABLE 3.19

Modewise fuel consumption (in lakh litres) per day in Delhi)

Mode	Fuel type	1957	1969	1981
Bus	HSD	0·06	0·18	1·08
Car	Petrol	0·22	0·59	0·83
Scooter/Motor cycle .	Petrol	0·01	0·20	0·86
Autorickshaw . .	Petrol	0·19	0·11	0·04
Taxi	Petrol	0·15	0·05	0·02

TABLE 3·20

Energy consumption (in tonnes of oil equivalent) per day in Delhi

Fuel type	1957	1969	1981
HSD . . .	5·06	15·17	91·02
Petrol . . .	42·42	70·70	130·22
TOTAL . . .	47·48	85·87	221·24

The energy consumed per 100 passenger kilometers (Table 3.21) in different cities varies over the cities although no specific trend could be observed, except in the case of the trips performed by bus (mass transport). In this case the energy consumed per 100 passenger kilometers reduces with the increase in the size of the city. Again, buses have the least energy consumption rates (per 100 passenger kilometers) among all the modes in all the cities. The energy consumption per 100 passenger kilometers depends on occupancy levels and fuel consumption rates (kilometers per litre). The results presented here are to be viewed with the limitation of fuel consumption rates (Table 3.13), in the sense that for all the cities the fuel consumption rates were assumed to be the same in the absence of specific rates for different cities, for the factors like terrain, climate, congestion etc. have an impact on them.

The 1986 economic cost of diesel (HSD) was US $ 150/- per ton and that of petrole (MS) was US $ 128/- ton. In the transport sector diesel and petrol consumed are generally measured by volume and not by weight. Therefore, the conversion of the economic costs of diesel and petrol per kilolitre (KL) of each fuel works out to be US $ 106/- (approx.), thereby showing no difference in the economic cost of both the fuels. The conversion factor of US $ 1=Rs. 12.312 (average for the 1st quarter of 1986) was used in evaluating the economic costs of energy consumed per 100 passenger kilometers. Table 3.22 and 3.23 give the expenditure on energy consumed per 100 passenger kilometers in terms of 1986 economic prices and basic ceiling selling prices (ex-storage point Bombay) inclusive of excise and customs. The expenditure in terms of basic ceiling selling prices are presented here as there is no difference in the economic prices of petrol and diesel and also to highlight the expenditure values from the view of the consumer. The expenditure at economic prices on energy consumed per 100 passenger kilometers is less than Rs. 1.50 for trips performed by bus in all the cities while it is over Rs. 2.00 for all the other modes and at basic ceiling selling prices this expenditure for buses is less than Rs. 3.50 and over Rs. 13.00 for all the other modes.

TABLE 3.21

Modewise fuel consumption (in litres) per 100 passengers kilometers in different cities

City	Fuel type	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Bus . .	HSD	0·952	0·952	0·952	0·952	0·476	0·433	0·371
Car . . .	Petrol	5·907	5·280	4·238	4·726	4·726	4·726	6·020
Scooter/Motor cycle	Petrol	2·893	2·626	2·969	2·276	2·276	2·731	3·104
Autorickshaw .	Petrol	1·993	3·946	3·817	3·919	3·359	3·359	..
TAXI . . .	Petrol	6·237	8·056	3·463	..	..	4·640	8·286

TABLE 3.22

Modewise expenditure (in Rs.) on fuel per 100 passenger kilometres in different cities (at 1986 economic prices)

City	Fuel type	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Bus . . .	HSD	1·242	1·242	1·242	1·242	0·621	0·565	0·484
Car . . .	Petrol	7·709	6·890	5·531	6·167	6·167	6·167	7·856
Scooter/Motor cycle	Petrol	3·775	3·427	3·875	2·970	2·970	3·564	4·051
Autorickshaw .	Petrol	2·601	5·150	4·981	5·114	4·383	4·383	..
Taxi . . .	Petrol	8·139	10·513	4·519	..	..	6·055	10·813

TABLE 3.23

Modewise expenditure (in Rs.) on fuel per 100 passenger kilometers in different cities (at 1986 basic ceiling selling prices)

City	Fuel type	Trivandrum	Cochin	Calicut	Jaipur	Pune	Delhi	Greater Bombay
Bus .	HSD	3·034	3·034	3·034	3·034	1·517	1·380	1·183
Car . . .	Petrol	40·575	36·268	29·111	32·463	32·463	32·463	41·351
Scooter/Motor cycle	Petrol	19·872	18·038	20·394	15·634	15·634	18·759	21·321
Autorickshaw .	Petrol	13·690	27·105	26·219	26·920	23·073	23·073	..
Taxi . . .	Petrol	42·842	55·337	23·787	..	..	31·872	56·917

Note : The prices are inclusive of excise and customs and as prevailing at ex-storage point Bombay.

CHAPTER 4

INDUSTRIAL SECTOR

In the earlier version of this report which was submitted to the Commission we had attempted to arrive at an estimation of energy demand in the industrial sector, related to different patterns of urbanisation. This analysis was admittedly weak in view of the major data limitations that we are confronted with and the fact that there is no established and inflexible relationship between urbanisation and industrialisation, and therefore between urbanisation and use of energy in the industrial sector.

Firstly, industrial energy consumption data are available through the Annual Survey of Industries (ASI) broken down by different states. There is no data base by which industrial energy consumption in urban areas can be separately estimated and established. Given the fact that several industries in a state may be in rural, backward or other non-urban areas, industrial activity at the state level cannot be seen in terms of urbanisation.

Secondly, industrialisation does not necessarily follow an invariable path related to urbanisation, and in fact the location of industry is heavily influenced by the Central Government's policies which take on the form of licensing, incentives, disincentives and the policies of financial institutions and state governments. Theoretically, we could typically establish industrial activity with a high rate of growth without necessarily disturbing urban areas. The interim report of the Commission refers to the case of industries located outside the city limits of Baroda which is an extreme example of industrial location decision which obviously defeats the purpose of industrial dispersal while adhering to the letter of the law. However, there are ample examples of industrial activity which has grown substantially in several remote and rural areas, but which may, of course, ultimately become urbanised. Consequently, in our opinion energy in the context of urbanisation is a non-issue as far as it relates to the industrial sector. We would only state, in this context, that some principles will have to be upheld for the growth of industry for the future.

1. Industry should be located in urban or suburban locations only after a clear evaluation has been carried out of the implications of labour demand and employment effects etc. For instance, if industries are allowed to be established in major metropolitan areas by increasing reliance on large numbers of unskilled workers, this would obviously be an invitation to migration from rural areas and the growth of slum dwellings.

2. In the aggregate, the country as a whole would have to move in the direction of low energy intensive industries, which would have some implications for employment and urbanisation. In general, for a given industry energy and capital are complements in the short run, but substitutes in the long run. Consequently if large employment is not to be generated over a period of time in any urban area, the only choice may be to go in for capital intensive industries which would not aggravate the demand for labour in the particular area. If on the other hand, the intention is to promote the development of small towns, then labour intensive industries would need to be dispersed into such small towns whereby the demand for labour would act as a magnet for rural labour supply, and contribute to the growth of smaller towns in rural, rather than growth of large metropolitan areas.

3. Very clear policies would need to be enunciated on industrial location, whereby the distribution of demand for energy in the industrial sector would be spread into areas and regions of the country that result in urban growth of the kind that is desirable. In this context, the resource endowment of different regions needs to be clearly kept in mind. For instance, in areas where natural gas is likely to be in abundance, fertilizers, petrochemicals and such industries would obviously gain

preference over other types of industrial units. In areas where hydro-electricity can be produced at low cost, aluminium production would have locational advantages over other possible sites. We have not always kept this simple economic principle in mind in the past.

If the country is to have a particular industrial profile as is projected in the aggregate, this profile can be achieved through a variety of locational options and in the aggregate the total demand of energy in the industrial sector would not have altered. However, through the exercise of clear policy choices it should be possible to pursue a pattern by which industrial locations are in consonance with desired urbanisation patterns and optimal use is made of energy resources that are available in a particular region. It is recommended, therefore, that future industrial plans for the country should result in industrial projects clearly in keeping with an overall urbanisation and industrial location plan which keeps these principles in focus. A suitable methodology and approach for this should be established and pursued by the Planning Commission and Departments of the Government of India.

In order to provide some data of industrial energy use, we have included our original chapter submitted in the earlier version of our report as an Appendix to this particular report. (Appendix II).

CHAPTER 5

COMMERCIAL AND SERVICES SECTOR

The general category of commercial and service sector includes a variety of energy users ranging from high-rise official buildings, restaurants and public utilities such as municipal water supply, sewage system, street lighting etc. There has been little study of energy use in these sectors, in part perhaps because they are relatively small users of petroleum fuels. In the modern cities, however, growth in the sizes and numbers of buildings and extent of public services provided have become a major force pushing electricity demand upward.

After a thorough literature/data review it was realised that almost no data is available on the energy-use in the commercial sector. Only NCAER provided some information on energy consumed in establishments at the State level. For the services sector, some government publications provide district level information on electricity consumption. However, in 1983, the Systems Research Institute, Pune, conducted wide ranging energy surveys in eight urban communities of different size in the state of Maharashtra (Nair and Krishnayya 1985). The survey collected data on energy consumption in public services and utilities such as water supply, sewage and lighting. In this section we present the data obtained from their survey.

The sample of the above mentioned survey consisted of :—

(i) six small towns with population between 15 to 100 thousands;

(ii) medium sized cities with population between 100 and 500 thousand; and

(iii) one large city with population above half a million.

Table 5.1 provides information on the selected cities along with their population at the 1981 census. In the survey methodology, while the criterion for selecting a household and number of households surveyed were given, the sample size for the service sector was not specified.

TABLE 5.1

City	Population (1981 census)	Sample households
Junnar . .	18,310	102
Talegaon . .	22,508	108
Shrirampur . .	55,495	122
Satara . . .	83,604	123
Ahmednagar . .	1,81,239	125
Nanded . . .	1,90,829	131
Solapur . . .	5,14,461	236
Pune . . .	16,85,300	253

This survey had considered only selected public utilities which were thought to have important implications for energy supply and demand management. The utilities which were covered in the survey were municipal water supply, municipal sewage systems and street lighting.

Table 5.2 sums up the information obtained on energy consumed for various public utilities in the nine cities.

The trend observed from the data of the nine was that, as would be expected, with increase in the city size the level of energy consumed increases. This is due to the extent of services provided in these cities, which are naturally related to size.

TABLE 5.2

Energy used for municipal water supply, street lighting, and municipal sewage system

City	Total Energy Used (kg. cr./month)		
	Municipal water supply	Street lighting	Municipal sewage system
Junnar . .	..	3,672	..
Talegaon . .	8·50	6,527	731
Shrirampur .	19·55	15,400	..
Satara . .	6·53	30,288	..
Ahmednagar .	220·50	68,250	1,416
Nanded . .	164·07	41,859	4,521
Solapur . .	710·38	1,09,057	37,275
Pune . .	1,918·00	3,64,000	43,050

Note : Junnar, Shrirampur and Satara do not have underground sewage systems.

Let us elaborate on this point.

For municipal water supply, it was observed that as the city size increases, the total energy use for this service increased. It was also noted that the medium sized and large sized cities have a supply of piped water. However, not all the dwellings in the medium sized cities had individual connections for piped water, but this was usual in the larger cities like Ahmadnagar, Solapur or Pune. In Junnar, Talegaon, Shrirampur and Satara households generally depend on private wells or on public municipal taps for their water supply. Other major sources of water supply were observed to be rivers, canals, ponds etc.

For street lighting, the larger cities were found to have higher energy use. This is obviously associated with the overall development of the

city. The larger cities are characterised by higher economic activity and consequently better road networks and lighting arrangements. The longer metalled road lengths are likely to have higher demands for street lighting.

Again, for sewage systems—the municipal corporation has to take care of collection and disposal of solid waste and collection, pumping and sometimes, treatment of the liquid sewage. All these require fuel for transportation, for pumping and for treating the liquid waste. These services are rudimentary in small towns, but are being developed to a higher level in the middle sized and larger cities.

The most important element of energy demand for the commercial sector relates to shops, establishments, offices, schools and hospitals etc. All of these, except offices, provide consumer services or goods, the demand for which is generated by the population in an urban (or for that matter, non-urban) location. But these have hardly any policy implications for energy except that provision for supply of energy to meet the demands of these units would have to be made. And, of course, in consonance with national objectives efforts would have to be made to ensure high efficiency of energy use on all commercial appliances such as lighting in shops, heating and cooling in hotels, cooking in restaurants etc. In the case of offices, the location decision has to be part of urbanisation policy before the fact, because it involves questions of equipment and infrastructure in which energy is one part only. However, it must be mentioned that the increase in air-conditioning, largely in offices, is leading to power demand load curves which result in high capital investments in the power sector. The increasing peaks in demand need to be kept in mind while planning urban commercial establishments, since often this leads to shortages in supply by the power system.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

The analysis presented in this report has been limited by a lack of appropriate data on urban activities and energy demand and supply. However, through a thorough search of sources from which information was possibly available, we have attempted to present an analytical framework and conclusions, which would generally be valid in arriving at a framework for urban development policies. The sources of data used are mostly secondary in nature. However, in the household sector, the analysis was based on the primary data collected through surveys by TERI. For a more comprehensive and larger study, it would be desirable to carry out several primary surveys in the other major sectors of urban development, but this would require a much greater expenditure of time and resources. But household energy supply and consumption is by far the most important issue linking urbanisation policy with energy policy; this report has, therefore, emphasized this subject to a greater degree than other sectoral areas.

In general, our conclusions and policy implications can be discussed along sectoral lines as follows :

6.1 Household Sector

The consumption of energy in the household continues to dominate total energy consumption in an urban centre. In this report we have relied essentially on the survey conducted by TERI, in six cities of India.

The cities studies were : Delhi, Madras belonging to class I cities (population > 1 lakh).

Jaipur, Jabalpur belonging to class II cities (population between 20001 to 99999) and Sahibabad, Sanganer belonging to class III (population less than or equal to 20000)

Data and information on energy consumption collected by the National Council of Applied Economic Research were also included in order to provide some insights into casual relationships and co-relations influencing the choice of a fuel and consumption patterns.

6.1.1 The exact level of consumption of a specific form of energy depends not only on factors responsible for demand but also those which affect availability and supply of energy. For instance if kerosene and LPG are not available in a particular urban area, the population of that town would necessarily look for substitutes such as fuelwood, soft coke etc. In planning for the future therefore, it would not be enough to merely estimate demand as a set of rigid and unvarying figures, but to ensure that the actual pattern of consumption diesel is achieved through a proper mix of supply and distribution of different forms of energy.

6.1.2 The preference for modern forms of energy such as LPG and electricity in larger cities is the result not only of higher income levels and the non-availability or higher prices of traditional fuels but also because distribution systems for modern fuels are much better, leading to a greater consumption of these fuels.

6.1.3 Conversely, it appears that the relative availability of traditional fuels in smaller towns is far better than the distribution of modern fuels. It can also be concluded that a small town has adequate and easier access to a fuelwood supplying hinterland far better than a large city.

6.1.4 The income elasticity of demand is obviously positive and high, which reflects in much higher consumption levels, particularly electricity, in high income groups. Future projections would necessarily require taking into account income effects in a formal manner, so that an underestimation of future fuels does not bias forecasts downwards. In the past, most official forecasts dealing with energy have ignored this effect.

6.1.5 A comparison of the ownership pattern of energy intensive appliances such as air conditioners, geysers, heaters etc. revealed that their ownership was high in higher income groups. This is because of the inability of poor income groups to incur high capital costs for these appliances. As one could expect, the prices of such appliances would be an important determinant of energy demand. Hence large scale manufacture of energy using appliances, with consequent economics of scale, would most likely result in lower prices, which in turn would lead to higher levels of demand.

6.1.6 To an extent climatic conditions of a city also influence the demand for electricity. For instance in Delhi the demand for electricity in winters is much higher than in Madras. In summer also Delhi was observed to have higher consumption, particularly because in Madras the use of air coolers is absent due to their ineffectiveness in humid atmosphere.

6.1.7 A comparison of the shadow price of providing energy indicate that in terms of social

costs LPG is the cheapest fuel followed by kerosene and soft coke. Future policies should examine carefully the merits and demerits of promoting the use of a particular fuel. In principle, market prices should reflect, as far as possible, the social cost of supplying a fuel to consumers.

6.2 Transport Sector

The building block on which energy consumption in the transport sector was estimated was the number of trips and average trip length for different cities existing in the country. As it happens the transport sector is perhaps most sensitive to the effects of policies, investment policies for public transport and land use planning which characterizes city size and concentration of population. Consequently our conclusions pertaining to this sector were;

6.2.1 The number of trips and average length of trip are very specific to the pattern of development of an urban centre. For instance, between Jaipur and Trivandrum, despite similarities in population, the patterns of transportation between the two cities vary enormously.

6.2.2 Difference in cities and their variation in energy consumption are evident among several cities of the world. For instance Tables 6.1 and 6.2 given below reveals large disparity in transportation energy consumption.

6.2.3 A diverse set of variables would influence the demand for public transportation in urban areas. These would include high population density, which would make personal transportation difficult to sustain, as well as the spread of the city itself where the cost of private transport may be so high that a large demand for public transport would be generated.

6.2.4 In this analysis we have not taken into account inter-city transportation and the influences of different urbanisation patterns on energy consumption related to inter-city movement. However, there is evidence in the literature that large urban centres would require dense transportation between different cities, involving long transportation distances. This would be balanced by a multiplicity of short distance but less dense movements in the case of smaller towns. Consequently, the two may actually balance out. This analysis can only be done on the basis of actual locational, population, and commodity and passenger movement details. In general, road and railway development must preclude the growth of urban centres between which transport links could be required, so that optimal systems for inter-city movement are developed in each case.

TABLE 6.1

Urban gasoline consumption per capita, United States and other countries

Urban areas	Consumption Per Capita (gallons)	Relationship of Consumption in U.S. Cities to other cities (ratio)
U.S. Cities . .	416	1·0
Toronto . . .	248	1·7
Australian Cities .	218	1·9
European Cities .	97	4·3
Asian Cities . .	40	10·4

Source : Peter W. G. Newman and Jeffrey R. Kenworthy, "Gasoline Consumption and Cities : A Comparison of U.S. Cities with a Global Survey and Some Implications." (Draft submitted for publication), Murdoch University, Murdoch, Australia, December 1986.

TABLE 6.2

Gasoline consumption per capita in Selected U.S. Cities, 1980

City	Gasoline use per capita (gallons)	Share of Population Commuting to Work by Auto (per cent)	Activity Intensity[1]
Houston . .	546	94	14
Phoenix . .	512	95	13
Detroit . .	482	93	20
Denver . .	462	88	20
Los Angeles .	428	88	29
San Francisco .	424	78	23
Washington .	374	81	21
Boston .	374	74	20
Chicago . .	353	76	26
New York .	322	64	31
Average . .	416	83	22

[1]Activity intensity is a measure of the number of residents plus jobs per erhectare in a metropolitan area.

Source : Peter W.G. Newman and Jeffrey R. Kenworthy, "Gasoline Consumption and Cities : A comparison of U.S. Cities with a Global Survey and Some Implications." (Draft submitted for publication), Murdoch University, Murdoch, Australia, December 1986.

6.2.5 Overall the total energy consumed in intra-city transport is small in relation to other sectors, and therefore obviously urbanisation policies would not be influenced strongly by considerations of internal transport energy use.

6.3 Industrial Sector

The effect of city size non-industrial development is a complex issue which cannot be investigated in isolation of a country's overall industrial development. Also, the location of various types of industries in a city would be influenced by

the already existing industry base in the city or close to it. For instance, in the vicinity of a large industry, smaller industries are bound to come up to produce goods related to the requirement of the large industry. Also, the location of large energy intensive industry would be influenced by the availability of energy, proximity to markets and several other elements of infrastruture which are required as inputs for an industry. It was, therefore, felt that city size need not have much effect on the existence of various types of industries.

6.4 Commercial and Service Sector

6.4.1 Energy use in commerce and in the provision of public services needs further study. No data exist on energy required to provide commercial and institutional facilities. The basic energy related services needed for the operation of commercial/institutional establishments are lighting, ventilation and cooling and in some cases cooking and refrigeration. Climatic conditions would influence considerably the demand for energy for air conditioning, which is highly energy intensive. It would be important to study the extent to which building designs makes use of natural cooling techniques and what effect this would have on electricity demand. The use of better and more energy efficient building design should be promoted throughout the country for conserving energy in the future.

6.4.2 Energy consumed in the services sector was observed to have a direct relationship with the city size. This is because the extent of services, such as municipal water supply, sewage and street lighting provided in large cities is high (although it still has high potential for improvement) whereas in smaller cities they are scanty. In the future it is inevitable that provision of clean water is a national priority would make higher demands on energy. Since the services mentioned are an important element of human welfare, it is to be expected that most urban areas would require an intensification of efforts for their provisioning. However, there are enormous opportunities for efficiency improvements in the use of energy related to these services and these would have to be fully implemented.

6.5 General

6.5.1 The general conclusions from this study indicate that the energy implications of different patterns of urbanisation are not based on invariate relationships. Essentially the very design of urban centres wherein the future growth of urban population is designed to be located, would have to address the question of energy use and supply through appropriate investments and other provisions. Purely from the energy point of view it is difficult to state that there are appreciable benefits in smaller urban centres as against large cities. The desirability of small towns versus large cities would be based on other factors such as problems of congestion, spiraling land prices, environmental pollution, etc. But energy, it appears would not be a major factor in this set of compelling reasons, except to the extent of ensuring that energy supply arrangements be planned optimally to meet demand, particularly for the household sector.

If human welfare is to be maximised, and optimal use of energy resources and supply are to be ensured, then it is essential for urban planners and policy makers to manage the energy aspects of urbanisation by appropriate investments in public transport. As the following table indicates, the intensity of energy use in different modes of transportation varies considerably. Given the long gestation of public transportation projects, population and intra-city urban transport demand should be projected atleast 15-20 years in advance, and investments made accordingly.

6.5.2 There appear to be economies of scale in intra-city transportation, which occur up to a certain range of size and density of population. Beyond that range diseconomies set in, such as in the case of Greater Bombay, wherein the intensity of transportation energy use is appreciably high. Optimal use of energy resources would require that the large metropolitan areas of the country should not be allowed to grow further, or else this would complicate the already difficult energy consumption pattern in these cities. Among cities up to 3 million in size, it appears that transportation energy would be influenced more by land use patterns and the spread of habitats, employment centres, commercial districts etc. rather than sheer size itself.

6.5.3 Given the fact that non-commercial forms of energy are becoming increasingly scarce, and in some cases overpriced in relation to the incomes of the lowest sections of society, it is important to strengthen the distribution and supply of commercial fuels. In the absence of efforts in this direction the demand for biomass fuels will continue to grow, leading to pressures on receding forest areas. It is quite evident from the study that substitution responses between commercial and non-commercial fuels in the sector are quite strong, and these can be set in motion only when appropriate and adequate supplies of commercial fuels are available. It is also essential to articulate and implement policies both nationally and at a regional level to harness greater use of renewable forms of energy. This applies, of course, to a greater use of solar water heating in urban areas, but also to better use of day lighting techniques in building design. In essence, the major conclusion from this study is that energy is not influenced in a major way by different sizes of urban centres. However, energy is a matter of vital concern for several activities in an urban area, and therefore at the very stage of planning urban developments either afresh or at different stages of growth, the energy implications need to be carefully estimated and built into the development plans of the particular area.

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APPENDIX I

TATA ENERGY RESEARCH INSTITUTE

Schedule

Energy Consumption in Urban Households

(Study Sponsored by Government of India)

A. General Information

1. Schedule Number.....2. House Address .....

3. Name of the Respondent..... 4. Family Size....., Adults....., Young.....

5. Floor Area (yards)..... 6. Accommodation (Nos.) Room..... Kitchen..... Bathroom.....

7. Monthly Income (Rs.) <500, 501—1000, 1001—1500, 1501—2000, 2001—2500, 2501—3000, 3001—3500, 3501—4000, 4001—4500, 4501—5000, 5001—5500, 5501—6000, /6000.

(Pl. encircle the appropriate category)

B. Non-Electric Appliances in Use

Fuel type	Device		Monthly average consumption			Monthly expenditure (Rs.)	How long do you have to wait to get (days)	Percentage mix		
	Nos.	Type	(Unit)	Summer	Winter			cooking	lighting	water heat
1. LPG cylinder			Nos.							
2. Kerosene			Lit.							
3. Soft coke			Kg.							
4. Firewood			Kg.							
5. Dungcake			Nos.							
6. Others (Pl. specify)										

C. Electric Appliances in Use

Electric Appliances	Numbers	Capacity/ Size	Average hours used daily		Make	Year of Purchase
			weekdays	holidays		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Summer Gadgets						
1. Ceiling Fans						
2. Table/Pedestral Fans						
3. Air Conditioners						
4. Central Air Conditioners						
5. Air Coolers (Exhaust Fan type)						

Apppendix I—*Concld.*

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Winter Gadgets						
1. Immersion Rod						
2. Room Heater						
3. Coil Heater						
All Seasons Gadgets						
1. Hot Plate						
2. Cooking Range						
3. Washing Machine						
4. Iron						
5. Fluorescent Tubes						
6. Incandescent bulbs						
7. Exhaust Fan						
8. Refrigerators						
9. Television (Black & White)						
10. Television (Colour)						
11. VCR						
12. Cassette Player						
13. Radio						
14. Transistor						
15. Instant Geysers						
Remarks (if any)						

D. Please specify your monthly electricity bill (Rs.) ?

1. Summer months..... 2. Winter months.....

GMGIPN—S4—329 Min. of Urban Dev./ND/88—30-4-90—500